

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled data based on original data using
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: INVUE

Report Number: P871384

Luminaire Tested: EMM2-HSN-SA1A-830-U-5WQ

Issue Date: 09/05/2024

Test Information

Test Method: LM-79-2024
Report Number: P871384
Test Lab: INNOVATION CENTER(G3)
Issue Date: 5/19/2026
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: INVUE
Catalog Number: EMM2-HSN-SA1A-830-U-5WQ
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 40W 80CRI 3000K FIXTURE w/ TYPE V SQUARE WIDE DISTRIBUTION OPTIC
Light Source: (10) 3000K CCT, 80 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4470.9 lumens
Efficiency: N/A
Efficacy: 136.3 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type V - Short
BUG Rating: B3 - U0 - G1

Input Watts (W): 32.8
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.76%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT

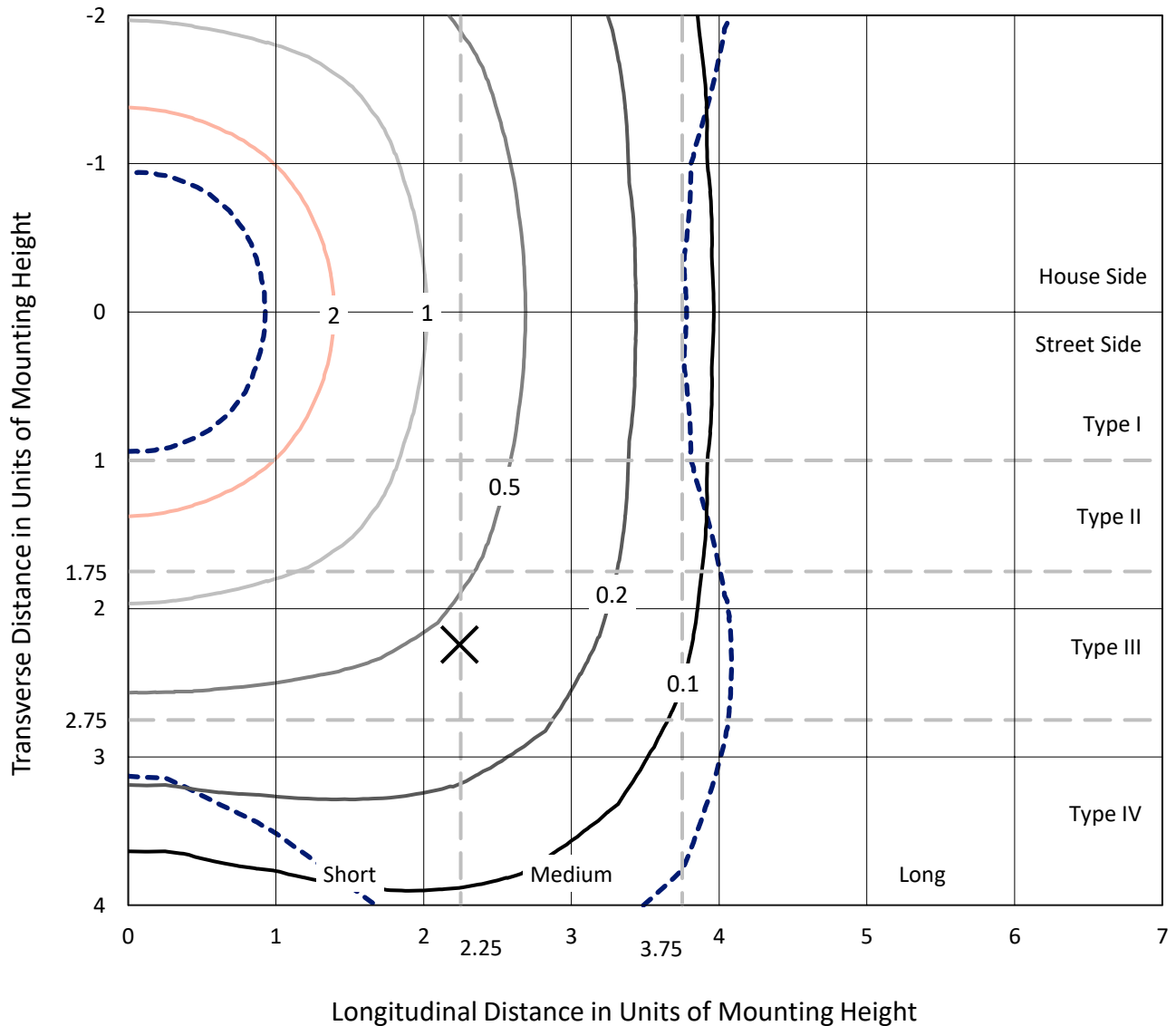


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Iso-Footcandle Lines of Horizontal Illumination

× Max cd
 - - - 1/2 Max cd

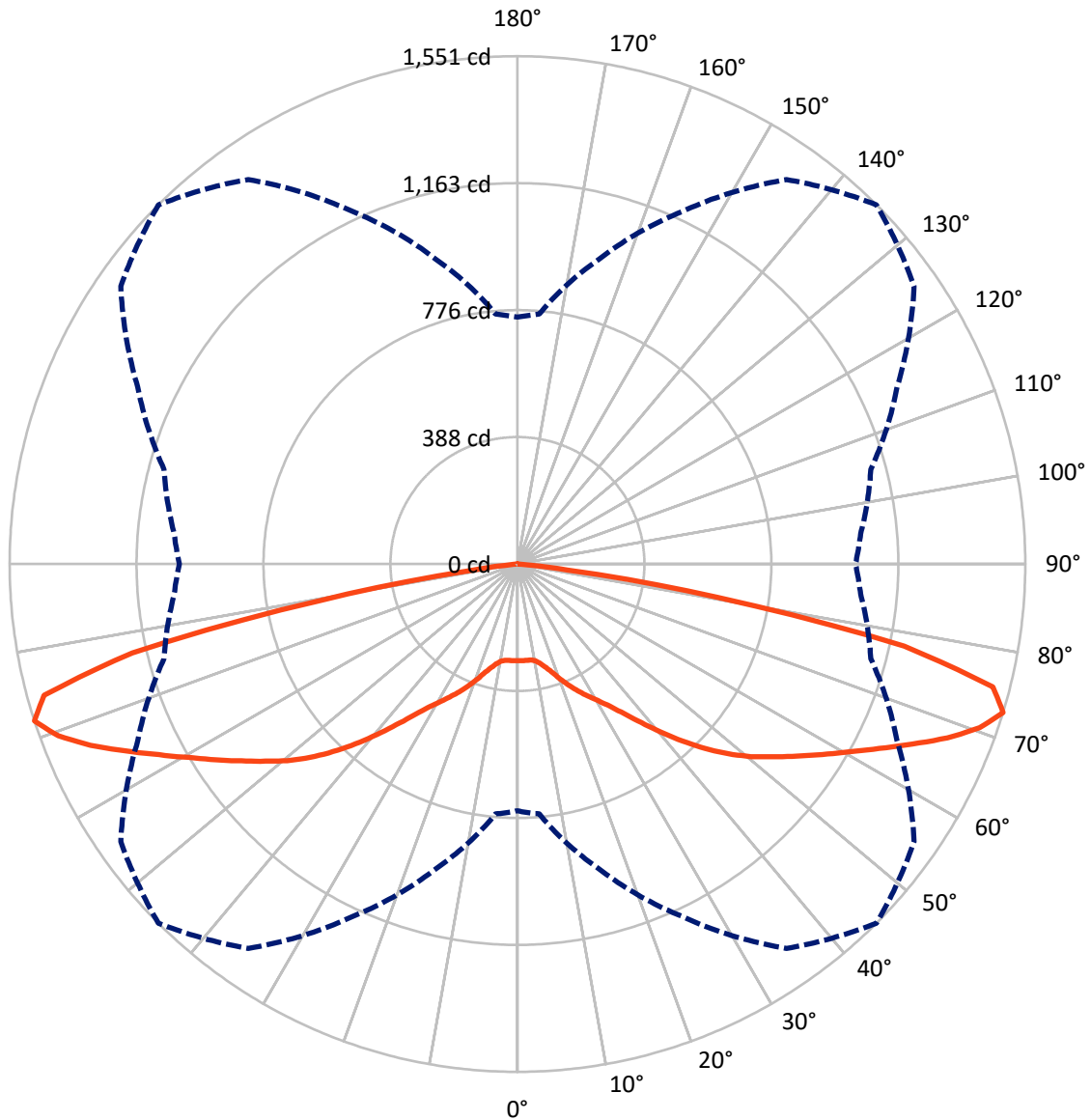


Based on 10 foot mounting height. Maximum calculated value = 3.2 fc
 Type V - Short - N/A

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Luminous Intensity Polar Plot



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

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FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	2235.5	0.0	2235.5
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	2235.5	0.0	2235.5
	% Fixture	50.0	0.0	50.0
Total	Lumens	4470.9	0.0	4470.9
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	28.3	0.6
10°-20°	94.4	2.1
20°-30°	194.8	4.4
30°-40°	358.6	8.0
40°-50°	630.6	14.1
50°-60°	914.5	20.5
60°-70°	1192.2	26.7
70°-80°	991.0	22.2
80°-90°	66.5	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°	4470.9	100.0
0°-180°	4470.9	100.0



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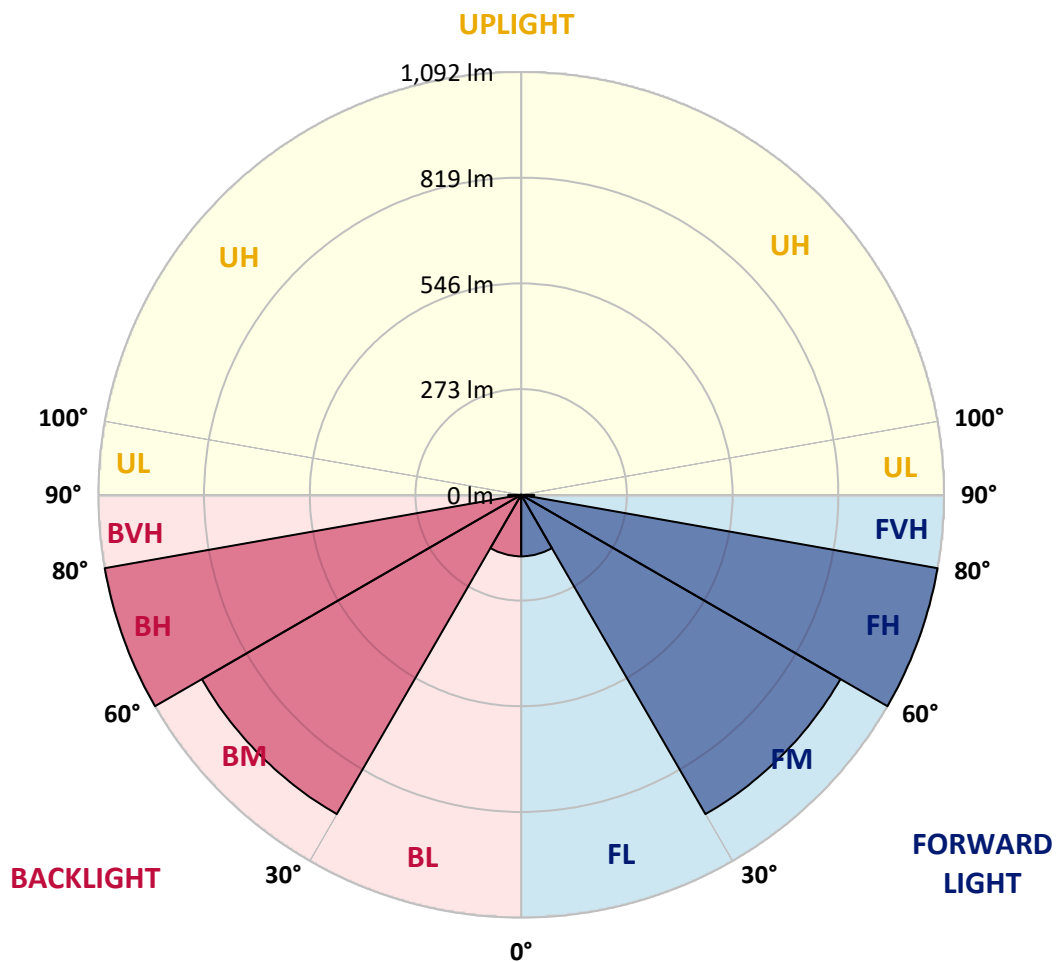
CATALOG NUMBER: EMM2-HSN-SA1A-830-U-5WQ

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit		
				B	U	G
FL	(0°-30°)	158.7	3.6			
FM	(30°-60°)	951.8	21.3			
FH	(60°-80°)	1091.6	24.4			G1/1800
FVH	(80°-90°)	33.3	0.7			G1/100
BL	(0°-30°)	158.7	3.6	B1/500		
BM	(30°-60°)	951.8	21.3	B1/1000		
BH	(60°-80°)	1091.6	24.4	B3/2500		G1/1800
BVH	(80°-90°)	33.3	0.7			G1/100
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B3-U0-G1

Type V Short





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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	295.2	295.2	295.2	295.2	295.2	295.2	295.2	295.2	295.2	295.2	295.2
2.5°	294.2	294.7	294.7	294.7	295.2	295.6	296.1	296.5	297.5	297.9	297.9
5°	295.6	295.2	294.7	295.6	295.6	295.6	296.1	296.5	296.5	296.5	297.0
7.5°	294.2	294.7	294.2	294.2	295.6	296.1	295.6	295.2	295.2	295.6	295.6
10°	299.3	298.9	298.4	298.4	299.8	300.3	299.8	299.3	299.3	300.3	300.3
12.5°	310.9	311.8	309.1	309.1	310.9	311.8	310.4	310.0	310.4	311.4	311.4
15°	329.0	328.5	326.7	324.8	326.7	328.1	326.2	325.3	325.7	328.1	326.2
17.5°	348.9	349.4	347.5	345.7	347.1	348.9	346.1	343.8	344.3	345.2	344.3
20°	371.1	370.7	370.2	370.2	373.0	375.3	371.1	365.6	364.2	363.3	363.3
22.5°	387.4	388.8	389.2	393.4	399.9	402.2	396.6	389.2	383.7	380.9	379.0
25°	412.9	411.5	410.5	415.2	424.9	429.1	422.1	411.9	406.4	405.9	407.3
27.5°	436.0	436.0	437.9	442.5	451.8	455.9	449.9	439.7	436.9	436.9	435.6
30°	466.1	464.7	466.6	474.5	481.4	484.2	479.1	472.2	469.8	469.8	467.5
32.5°	501.4	501.8	504.6	509.7	516.6	517.1	515.3	512.0	510.6	509.2	511.5
35°	555.1	555.1	554.2	557.9	559.7	560.7	561.6	560.2	560.2	560.2	558.3
37.5°	621.8	618.1	617.7	614.4	612.1	614.4	618.6	623.2	626.9	624.6	623.7
40°	688.1	686.2	680.7	675.6	673.7	674.6	679.7	689.5	693.6	693.6	697.4
42.5°	759.4	755.7	748.8	742.8	737.7	739.1	743.7	755.7	765.0	769.2	767.3
45°	823.4	820.1	813.2	807.6	803.9	803.5	809.5	817.4	829.9	833.6	836.4
47.5°	878.1	875.7	869.7	864.2	865.6	866.0	867.9	874.8	885.0	890.1	889.6
50°	922.5	920.7	915.1	917.4	921.2	924.9	922.5	927.2	933.7	936.0	937.8
52.5°	963.3	960.5	956.8	961.0	970.7	978.1	979.5	976.3	978.1	979.5	978.1
55°	1003.6	1000.4	999.5	1006.9	1021.7	1035.6	1034.2	1024.9	1022.6	1019.8	1018.5
57.5°	1036.5	1034.2	1037.9	1050.4	1079.2	1097.7	1091.7	1070.4	1061.1	1054.6	1052.7
60°	1057.4	1056.9	1065.3	1094.4	1138.0	1164.0	1154.2	1117.6	1096.8	1090.7	1088.0
62.5°	1068.5	1069.0	1083.8	1135.7	1205.2	1240.4	1223.3	1167.2	1134.8	1128.7	1129.7
65°	1078.7	1077.3	1096.8	1170.4	1277.9	1325.7	1302.5	1227.0	1179.7	1167.7	1167.7
67.5°	1086.1	1087.5	1116.7	1205.2	1348.8	1416.9	1383.1	1290.5	1227.9	1209.8	1207.5
70°	992.5	1005.9	1097.2	1228.4	1404.9	1497.6	1453.1	1329.4	1229.8	1178.3	1173.2
72.5°	753.9	766.4	963.8	1187.1	1433.6	1551.3	1479.0	1279.8	1117.6	1052.3	1032.8
75°	497.2	506.0	718.2	1037.0	1353.9	1500.4	1347.0	1102.3	879.9	795.1	800.2
77.5°	221.5	249.7	457.8	809.0	1115.3	1207.5	1027.3	752.0	537.5	455.0	446.2
80°	92.7	101.5	172.8	431.4	646.4	618.6	437.4	252.1	160.3	124.6	120.5
82.5°	26.9	27.8	34.3	74.6	131.6	154.8	93.1	47.3	44.9	35.7	32.9
85°	1.9	1.9	2.8	4.6	6.5	10.7	12.0	13.9	15.8	13.4	13.4
87.5°	0.9	0.9	0.9	1.4	1.4	1.9	1.4	1.4	1.4	1.4	1.4
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



Test Information

Test Method: LM-79-2019
 Report Number: SP1-2408-195-9
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/07/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: MCGRAW EDISON
 Catalog Number: **GALN-SB1A-830-U-5WQ**
 Description: GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS

Spectral Parameters

CCT (K): 3050
 CIE u': 0.2476
 CIE v': 0.5251
 Duv: 0.0034
 CIE x: 0.4383
 CIE y: 0.4131
 CIE z: 0.1487
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 581
 Purity: 55.55201
 Rf: 81.5
 Rg: 99.2

CRI (Ra):	81.0		
R1:	79.6	R9:	7.1
R2:	85.6	R10:	67.0
R3:	92.0	R11:	82.7
R4:	82.6	R12:	63.2
R5:	78.9	R13:	80.3
R6:	81.7	R14:	95.0
R7:	85.2	R15:	71.7
R8:	62.0		



Test Conditions

Stabilization Time: 20M
 Operation Time: 1H 20M
 Sphere Temperature (°C): 24.2

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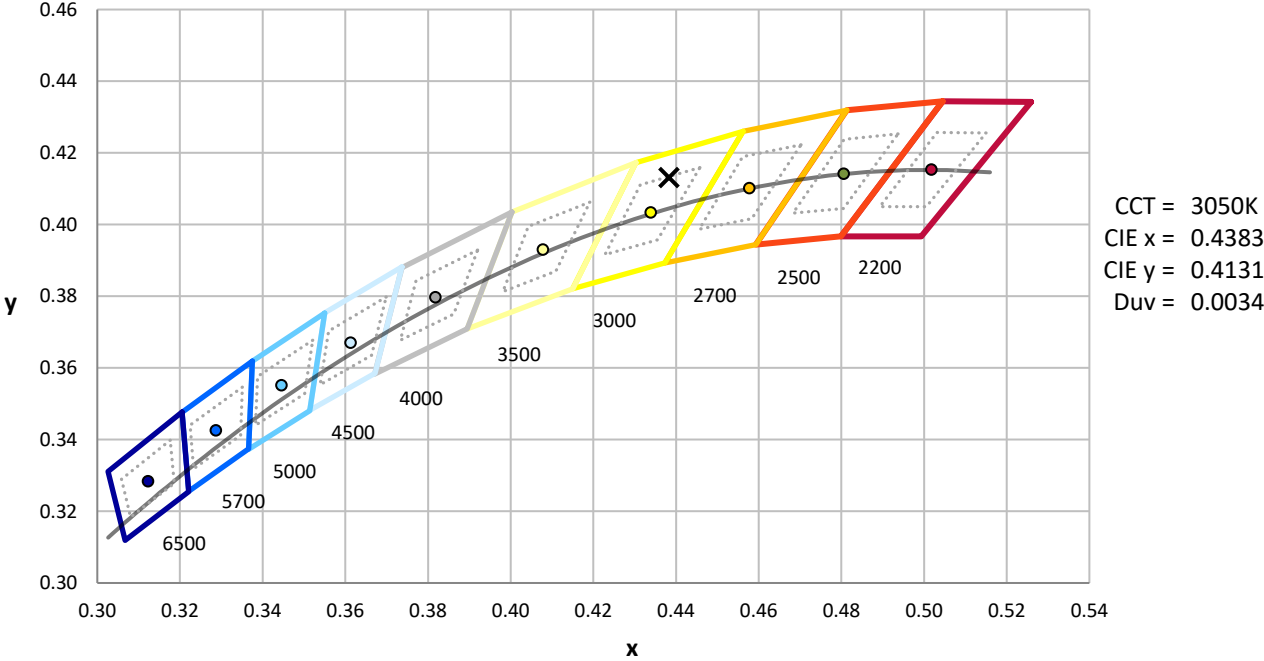
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/24/2023	10/24/2024
DC Power Source	IN0208	10/24/2023	10/24/2024
Sphere Thermometer	IN0085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



Point lies inside the ANSI 3000K 4-step quadrangle

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Photopic Flux vs. Wavelength

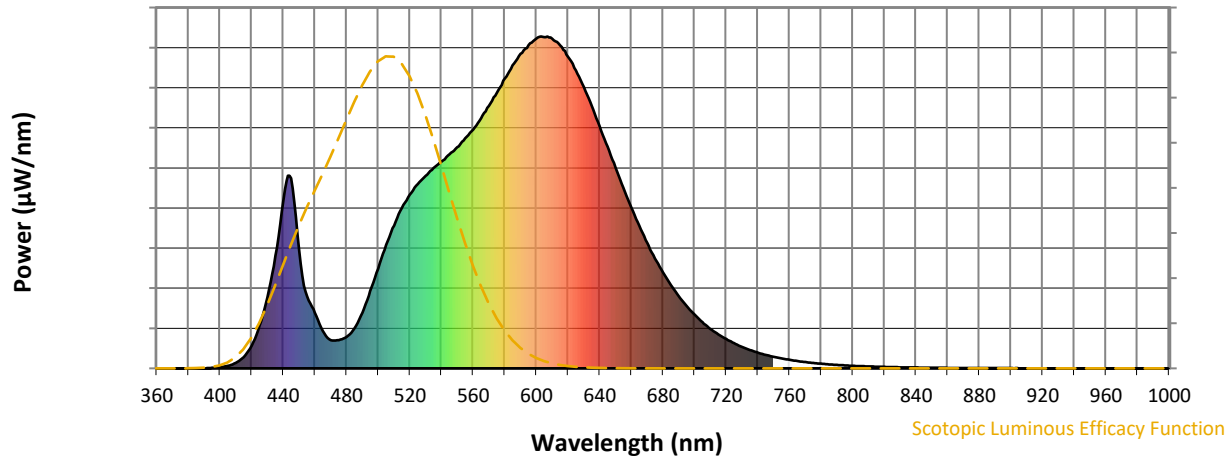


Photopic Lumens: NR

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	168	NR	620	940	NR	750	35	NR	880	1	NR
365	0	NR	495	233	NR	625	897	NR	755	30	NR	885	1	NR
370	0	NR	500	300	NR	630	847	NR	760	26	NR	890	1	NR
375	0	NR	505	372	NR	635	790	NR	765	22	NR	895	1	NR
380	0	NR	510	430	NR	640	730	NR	770	19	NR	900	1	NR
385	0	NR	515	483	NR	645	668	NR	775	16	NR	905	1	NR
390	0	NR	520	524	NR	650	605	NR	780	14	NR	910	0	NR
395	2	NR	525	555	NR	655	545	NR	785	12	NR	915	0	NR
400	4	NR	530	581	NR	660	485	NR	790	10	NR	920	0	NR
405	7	NR	535	604	NR	665	430	NR	795	9	NR	925	0	NR
410	17	NR	540	623	NR	670	378	NR	800	8	NR	930	0	NR
415	34	NR	545	645	NR	675	331	NR	805	7	NR	935	0	NR
420	68	NR	550	667	NR	680	290	NR	810	6	NR	940	0	NR
425	128	NR	555	693	NR	685	251	NR	815	5	NR	945	0	NR
430	214	NR	560	719	NR	690	218	NR	820	4	NR	950	0	NR
435	339	NR	565	754	NR	695	188	NR	825	4	NR	955	0	NR
440	507	NR	570	791	NR	700	162	NR	830	3	NR	960	0	NR
445	573	NR	575	830	NR	705	139	NR	835	3	NR	965	0	NR
450	356	NR	580	873	NR	710	119	NR	840	3	NR	970	0	NR
455	217	NR	585	913	NR	715	102	NR	845	2	NR	975	0	NR
460	168	NR	590	948	NR	720	88	NR	850	2	NR	980	0	NR
465	113	NR	595	974	NR	725	76	NR	855	2	NR	985	0	NR
470	85	NR	600	994	NR	730	65	NR	860	1	NR	990	0	NR
475	85	NR	605	998	NR	735	55	NR	865	1	NR	995	0	NR
480	94	NR	610	994	NR	740	47	NR	870	1	NR	1000	0	NR
485	120	NR	615	973	NR	745	41	NR	875	1	NR			

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Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.27

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	168	NR	620	940	NR	750	35	NR	880	1	NR
365	0	NR	495	233	NR	625	897	NR	755	30	NR	885	1	NR
370	0	NR	500	300	NR	630	847	NR	760	26	NR	890	1	NR
375	0	NR	505	372	NR	635	790	NR	765	22	NR	895	1	NR
380	0	NR	510	430	NR	640	730	NR	770	19	NR	900	1	NR
385	0	NR	515	483	NR	645	668	NR	775	16	NR	905	1	NR
390	0	NR	520	524	NR	650	605	NR	780	14	NR	910	0	NR
395	2	NR	525	555	NR	655	545	NR	785	12	NR	915	0	NR
400	4	NR	530	581	NR	660	485	NR	790	10	NR	920	0	NR
405	7	NR	535	604	NR	665	430	NR	795	9	NR	925	0	NR
410	17	NR	540	623	NR	670	378	NR	800	8	NR	930	0	NR
415	34	NR	545	645	NR	675	331	NR	805	7	NR	935	0	NR
420	68	NR	550	667	NR	680	290	NR	810	6	NR	940	0	NR
425	128	NR	555	693	NR	685	251	NR	815	5	NR	945	0	NR
430	214	NR	560	719	NR	690	218	NR	820	4	NR	950	0	NR
435	339	NR	565	754	NR	695	188	NR	825	4	NR	955	0	NR
440	507	NR	570	791	NR	700	162	NR	830	3	NR	960	0	NR
445	573	NR	575	830	NR	705	139	NR	835	3	NR	965	0	NR
450	356	NR	580	873	NR	710	119	NR	840	3	NR	970	0	NR
455	217	NR	585	913	NR	715	102	NR	845	2	NR	975	0	NR
460	168	NR	590	948	NR	720	88	NR	850	2	NR	980	0	NR
465	113	NR	595	974	NR	725	76	NR	855	2	NR	985	0	NR
470	85	NR	600	994	NR	730	65	NR	860	1	NR	990	0	NR
475	85	NR	605	998	NR	735	55	NR	865	1	NR	995	0	NR
480	94	NR	610	994	NR	740	47	NR	870	1	NR	1000	0	NR
485	120	NR	615	973	NR	745	41	NR	875	1	NR			

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Melanopic Flux vs. Wavelength



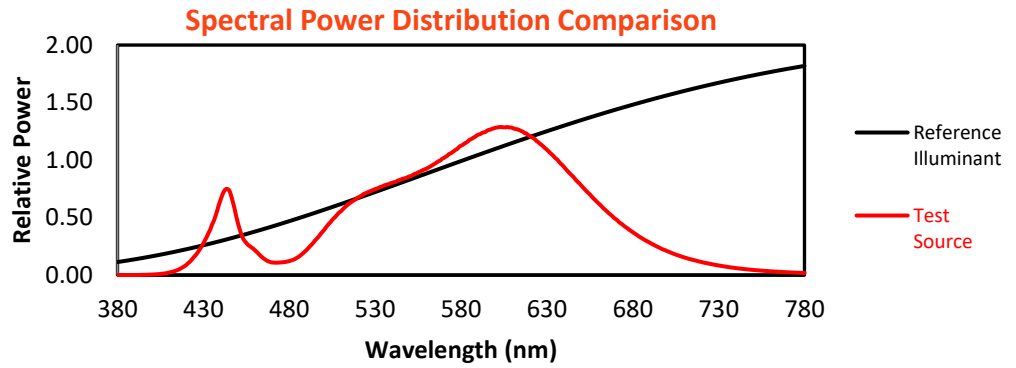
Melanopic Lumens: NR

M/P: 2.32

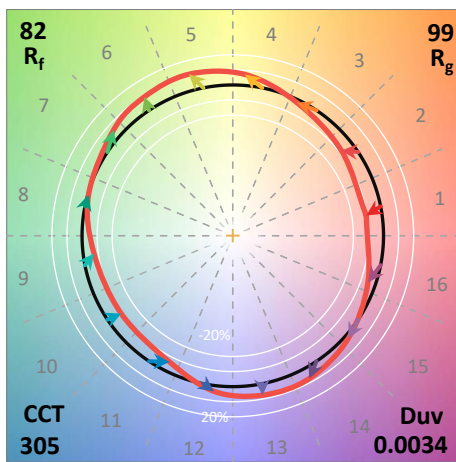
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	168	NR	620	940	NR	750	35	NR	880	1	NR
365	0	NR	495	233	NR	625	897	NR	755	30	NR	885	1	NR
370	0	NR	500	300	NR	630	847	NR	760	26	NR	890	1	NR
375	0	NR	505	372	NR	635	790	NR	765	22	NR	895	1	NR
380	0	NR	510	430	NR	640	730	NR	770	19	NR	900	1	NR
385	0	NR	515	483	NR	645	668	NR	775	16	NR	905	1	NR
390	0	NR	520	524	NR	650	605	NR	780	14	NR	910	0	NR
395	2	NR	525	555	NR	655	545	NR	785	12	NR	915	0	NR
400	4	NR	530	581	NR	660	485	NR	790	10	NR	920	0	NR
405	7	NR	535	604	NR	665	430	NR	795	9	NR	925	0	NR
410	17	NR	540	623	NR	670	378	NR	800	8	NR	930	0	NR
415	34	NR	545	645	NR	675	331	NR	805	7	NR	935	0	NR
420	68	NR	550	667	NR	680	290	NR	810	6	NR	940	0	NR
425	128	NR	555	693	NR	685	251	NR	815	5	NR	945	0	NR
430	214	NR	560	719	NR	690	218	NR	820	4	NR	950	0	NR
435	339	NR	565	754	NR	695	188	NR	825	4	NR	955	0	NR
440	507	NR	570	791	NR	700	162	NR	830	3	NR	960	0	NR
445	573	NR	575	830	NR	705	139	NR	835	3	NR	965	0	NR
450	356	NR	580	873	NR	710	119	NR	840	3	NR	970	0	NR
455	217	NR	585	913	NR	715	102	NR	845	2	NR	975	0	NR
460	168	NR	590	948	NR	720	88	NR	850	2	NR	980	0	NR
465	113	NR	595	974	NR	725	76	NR	855	2	NR	985	0	NR
470	85	NR	600	994	NR	730	65	NR	860	1	NR	990	0	NR
475	85	NR	605	998	NR	735	55	NR	865	1	NR	995	0	NR
480	94	NR	610	994	NR	740	47	NR	870	1	NR	1000	0	NR
485	120	NR	615	973	NR	745	41	NR	875	1	NR			

Summary

$R_f = 81.5$
 $R_g = 99.2$
 $CIE R_a = 81.0$
 $R_9 = 7.1$

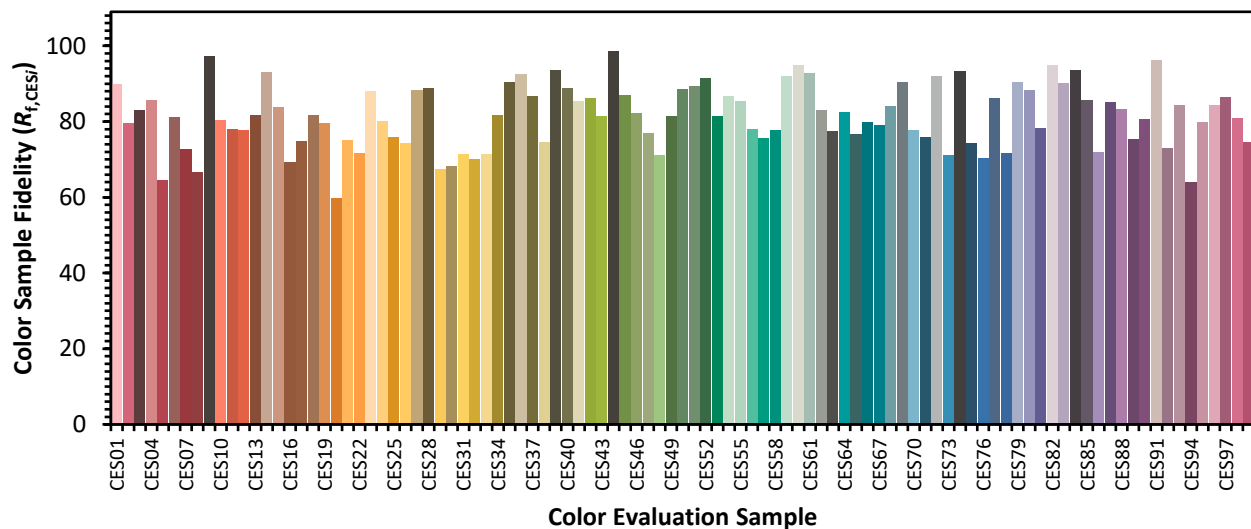


Color Vector Graphics

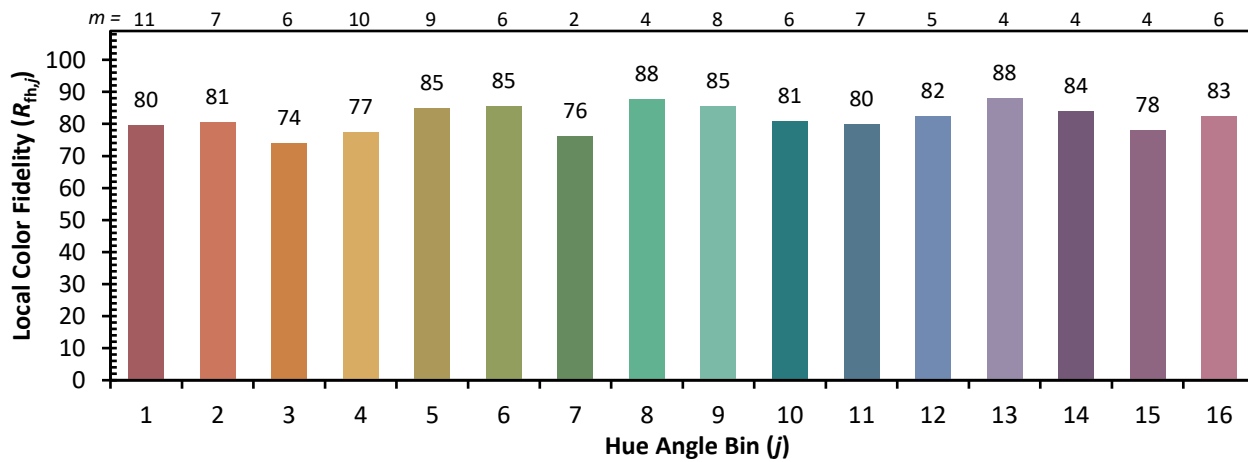
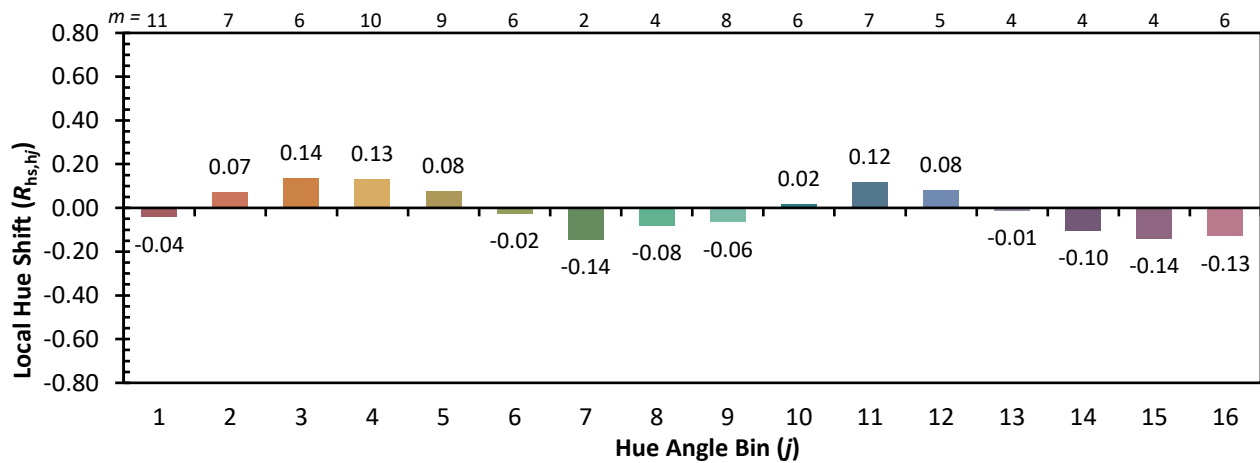
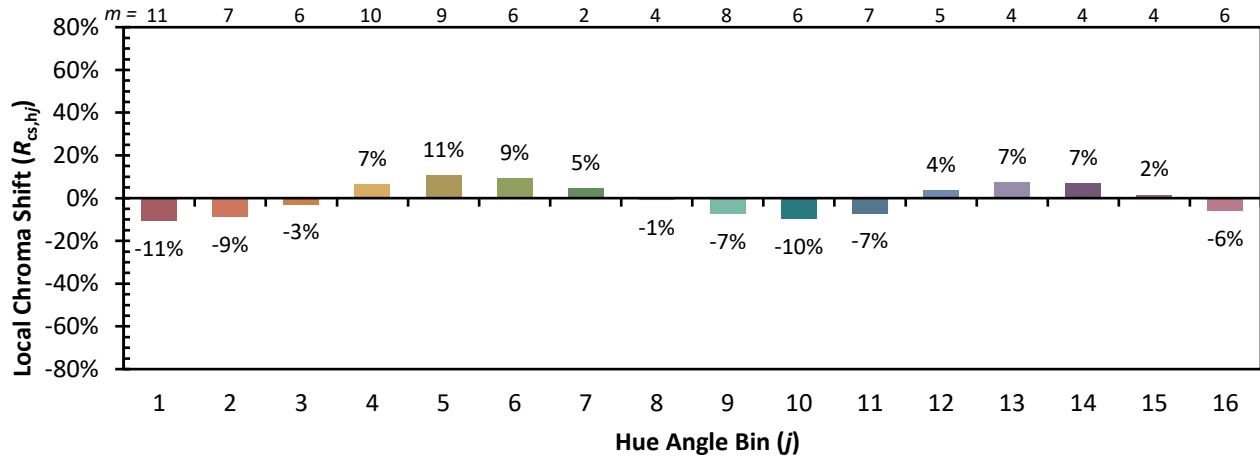


Individual Sample Fidelity Index ($R_{f,i}$)

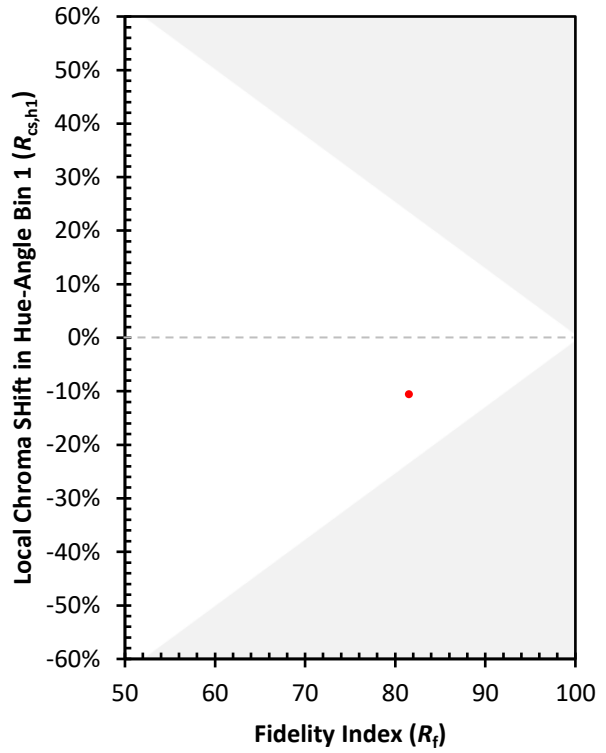
CES01 = 86	CES26 = 74	CES51 = 89	CES76 = 70
CES02 = 63	CES27 = 88	CES52 = 92	CES77 = 86
CES03 = 31	CES28 = 89	CES53 = 81	CES78 = 72
CES04 = 70	CES29 = 67	CES54 = 87	CES79 = 90
CES05 = 50	CES30 = 68	CES55 = 85	CES80 = 88
CES06 = 51	CES31 = 71	CES56 = 78	CES81 = 78
CES07 = 42	CES32 = 70	CES57 = 76	CES82 = 95
CES08 = 41	CES33 = 71	CES58 = 78	CES83 = 90
CES09 = 29	CES34 = 82	CES59 = 92	CES84 = 94
CES10 = 76	CES35 = 90	CES60 = 95	CES85 = 86
CES11 = 59	CES36 = 93	CES61 = 93	CES86 = 72
CES12 = 65	CES37 = 87	CES62 = 83	CES87 = 85
CES13 = 43	CES38 = 75	CES63 = 77	CES88 = 83
CES14 = 74	CES39 = 94	CES64 = 83	CES89 = 75
CES15 = 71	CES40 = 89	CES65 = 77	CES90 = 81
CES16 = 47	CES41 = 85	CES66 = 80	CES91 = 96
CES17 = 50	CES42 = 86	CES67 = 79	CES92 = 73
CES18 = 56	CES43 = 81	CES68 = 84	CES93 = 84
CES19 = 72	CES44 = 99	CES69 = 91	CES94 = 64
CES20 = 66	CES45 = 87	CES70 = 78	CES95 = 80
CES21 = 87	CES46 = 82	CES71 = 76	CES96 = 84
CES22 = 79	CES47 = 77	CES72 = 92	CES97 = 87
CES23 = 92	CES48 = 71	CES73 = 71	CES98 = 81
CES24 = 91	CES49 = 81	CES74 = 93	CES99 = 74
CES25 = 72	CES50 = 89	CES75 = 74	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)