Classified

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: NEO-RAY

Report Number: P78137

Luminaire Tested: **DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W**

Issue Date: 02/20/2024

Report Generated By 670245763 / DESKTOP-DVLU35A

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

Scaled Data Report

Test Information

Test Method:	LM-79-08
Report Number:	P78137
	TEST IS SCALED FROM IESNA LM-79-08 TEST DATA
Test Lab:	INNOVATION CENTER(G3)
Issue Date:	02/20/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	NEO-RAY
Catalog Number:	DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W
Description:	Define Geo Ring 3ft Diameter Direct/Indirect Fixture w/ Frosted Lens for Downlight and Bat-Wing Lens for UPLIGHT
Light Source:	2700K CCT, 90 CRI LEDS
Ballast/Driver:	ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	13003.3 lumens
Efficiency:	N/A
Efficacy:	70.0 lumens/watt
Spacing Criteria (0/90/45):	1.11 / 1.11 / 1.21
Luminous Opening:	Circular (Dia: 3' x H: 0')
CIE Type:	Semi-Direct

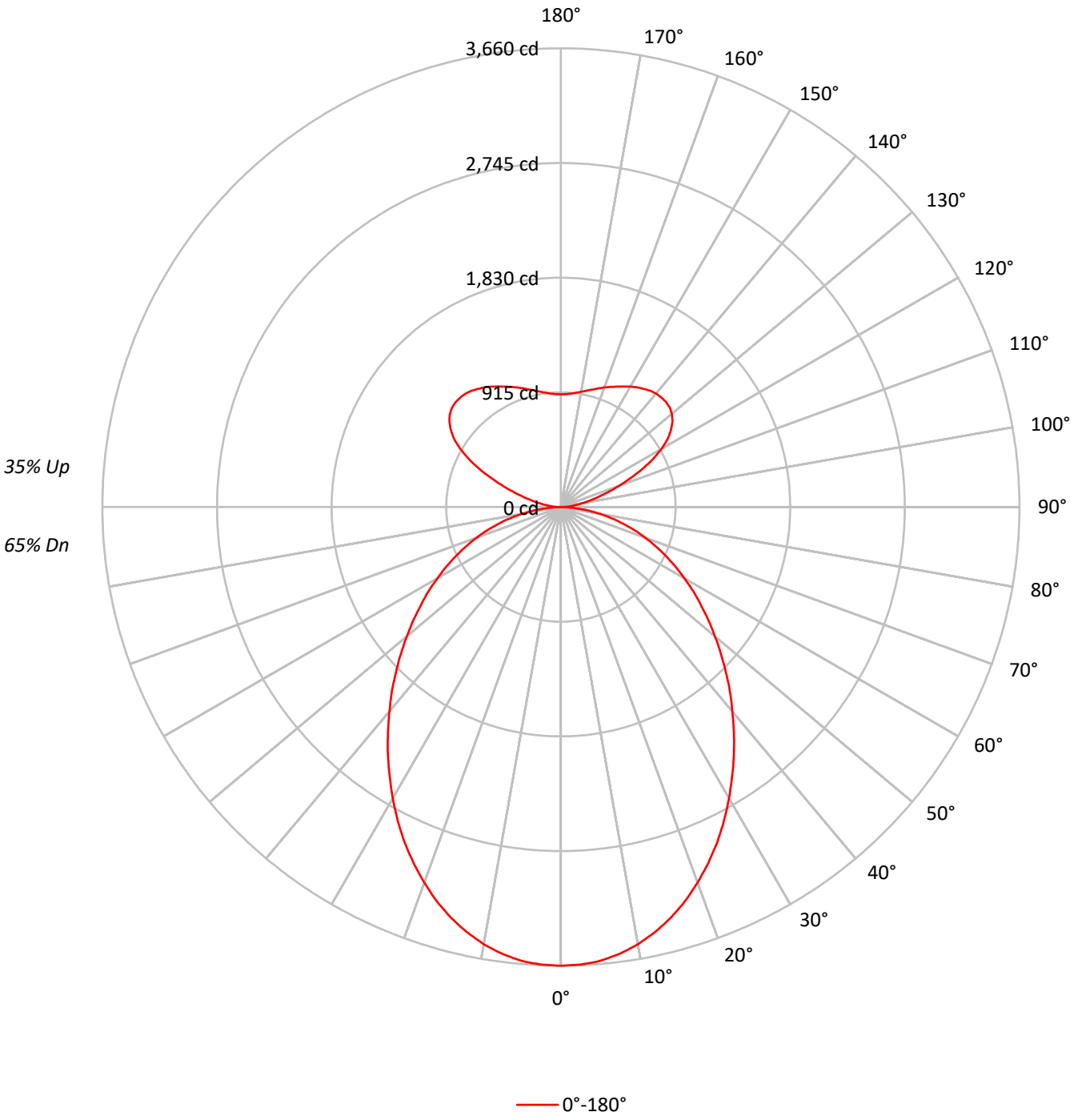
Input Watts (W):	185.8
Input Voltage (V):	120
Input Current (Ain):	NR
Voltage Rise (V):	NR
Power Factor:	NR
Total Harmonic Distortion (THDi):	NR
Frequency (hertz):	60
Stabilization Time:	NR
Operation Time:	NR
Ambient Temperature (°C):	NR
Test Distance:	25 FT

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

Scaled Data Report

TEST NUMBER: P78137
CATALOG NUMBER: DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W

Luminous Intensity Polar Plot



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

Scaled Data Report

TEST NUMBER: P78137
CATALOG NUMBER: DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20			20			20			20
RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	111	111	111	111	104	104	104	104	92	92	92	80	80	80	70	70	70	65
1	101	97	93	89	95	91	88	85	81	78	76	71	69	67	62	60	59	55
2	92	85	79	73	86	80	74	70	71	67	63	62	59	56	55	52	50	46
3	84	75	67	61	79	71	64	59	63	57	53	55	51	48	49	45	43	39
4	77	66	58	52	72	63	56	50	56	50	46	50	45	41	44	40	37	34
5	71	59	51	45	67	56	49	43	50	44	40	45	40	36	39	36	33	30
6	66	53	45	39	62	51	43	38	45	39	35	41	36	32	36	32	29	26
7	61	48	40	35	57	46	39	33	41	35	31	37	32	28	33	29	26	23
8	57	44	36	31	53	42	35	30	38	32	28	34	29	25	30	26	23	21
9	53	40	33	28	50	39	32	27	35	29	25	31	26	23	28	24	21	19
10	50	37	30	25	47	36	29	24	32	26	23	29	24	21	26	22	19	17

AVERAGE LUMINANCE (cd/sqm):

	0°
0°	5573
5°	5556
10°	5478
15°	5347
20°	5167
25°	4958
30°	4718
35°	4475
40°	4231
45°	4007
50°	3800
55°	3621
60°	3466
65°	3327
70°	3192
75°	3019
80°	2813
85°	2193

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

Scaled Data Report

TEST NUMBER: P78137
CATALOG NUMBER: DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	343.9	2.6
10°-20°	953.5	7.3
20°-30°	1356.4	10.4
30°-40°	1504.8	11.6
40°-50°	1438.0	11.1
50°-60°	1223.8	9.4
60°-70°	916.2	7.0
70°-80°	545.1	4.2
80°-90°	151.9	1.2
90°-100°	90.9	0.7
100°-110°	331.5	2.5
110°-120°	703.8	5.4
120°-130°	950.4	7.3
130°-140°	913.3	7.0
140°-150°	723.1	5.6
150°-160°	492.4	3.8
160°-170°	276.7	2.1
170°-180°	87.5	0.7
0°-30°	2653.8	20.4
0°-40°	4158.6	32.0
0°-60°	6820.4	52.5
0°-90°	8433.6	64.9
90°-120°	1126.2	8.7
90°-150°	3713.1	28.6
90°-180°	4570.0	35.1
0°-180°	13003.3	100.0

CANDELA DISTRIBUTION:

	0°	Flux
0°	3660	
5°	3634	344
15°	3392	954
25°	2951	1356
35°	2407	1505
45°	1860	1438
55°	1364	1224
65°	923	916
75°	513	545
85°	126	145
90°	4	13
95°	81	85
105°	305	331
115°	716	704
125°	1072	950
135°	1186	913
145°	1151	723
155°	1060	492
165°	971	277
175°	908	88
180°	900	

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

Scaled Data Report

TEST NUMBER: P78137
CATALOG NUMBER: DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W

CANDELA DISTRIBUTION (FULL):

	0°
0°	3659.6
2.5°	3654.0
5°	3634.5
7.5°	3595.5
10°	3542.5
12.5°	3472.7
15°	3391.8
17.5°	3297.0
20°	3188.2
22.5°	3073.9
25°	2951.1
27.5°	2820.0
30°	2683.3
32.5°	2543.9
35°	2407.2
37.5°	2267.7
40°	2128.3
42.5°	1997.2
45°	1860.5
47.5°	1732.2
50°	1603.9
52.5°	1483.9
55°	1364.0
57.5°	1255.2
60°	1138.1
62.5°	1032.1
65°	923.3
67.5°	820.1
70°	716.9
72.5°	616.4
75°	513.2
77.5°	418.4
80°	320.8
82.5°	223.1
85°	125.5
87.5°	47.4
90°	4.1
92.5°	40.7
95°	81.3
97.5°	123.4
100°	173.5
102.5°	231.8
105°	305.0
107.5°	390.4
110°	488.0

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

Scaled Data Report

TEST NUMBER: P78137
CATALOG NUMBER: DFN2DIP-RG3F0-090D050US927-FLL-OOB-1DUDD-W

CANDELA DISTRIBUTION (continued):

	0°
112.5°	*599.2*
115°	*715.8*
117.5°	*825.6*
120°	*925.9*
122.5°	*1010.0*
125°	*1072.4*
127.5°	*1122.5*
130°	*1156.4*
132.5°	*1176.7*
135°	*1186.2*
137.5°	*1186.2*
140°	*1182.2*
142.5°	*1170.0*
145°	*1151.0*
147.5°	*1132.0*
150°	*1109.0*
152.5°	*1084.6*
155°	*1060.2*
157.5°	*1037.1*
160°	*1015.4*
162.5°	*992.4*
165°	*970.7*
167.5°	*950.3*
170°	*934.1*
172.5°	*919.2*
175°	*908.3*
177.5°	*901.5*
180°	*900.2*

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

NEO-RAY

Report Number: SP1-2401-290-1

Test Date: 01/18/2024

Luminaire Tested: RNG2DIP-RG2F0-020D020US927-FLL-FLL-1-D-UDD-W

Data in this report applies to families of products including RNG2DIP-RG2F0-020D020US927-FLL-FLL-1-D-UDD-W.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v6.13

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

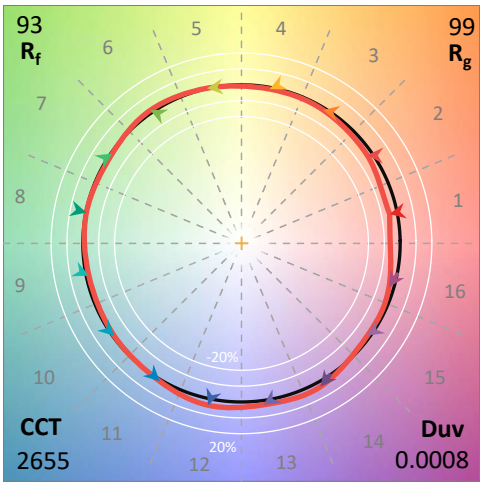
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2401-290-1
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	01/19/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	NEO-RAY
Catalog Number:	**RNG2DIP-RG2F0-020D020US927-FLL-FLL-1-D-UDD-W**
Description:	2' RING DIRECT/INDIRECT FIXTURE WITH FROSTED LIGHT LEVEL 1

Spectral Parameters

CCT (K):	2655	CRI (Ra):	93.4		
CIE u':	0.2643	R1:	93.4	R9:	59.7
CIE v':	0.5293	R2:	96.8	R10:	92.1
Duv:	0.0008	R3:	99.2	R11:	95.8
CIE x:	0.4648	R4:	94.0	R12:	87.6
CIE y:	0.4137	R5:	93.5	R13:	94.3
CIE z:	0.1215	R6:	97.2	R14:	98.8
Peak Wavelength (nm):	625	R7:	91.9		
Dominant Wavelength (nm):	584	R8:	81.5		
Purity:	63.9				

Rf:	93.2
Rg:	98.9



Test Conditions

Stabilization Time:	23M
Operation Time:	12H
Room Temperature (°C) / RH%:	25.6/15%
Sphere Temperature (°C):	25.0

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

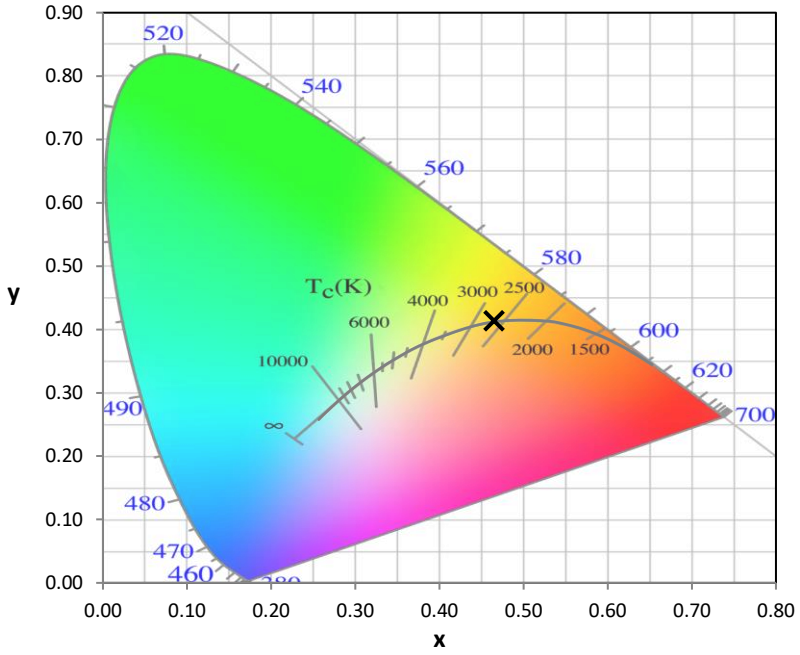
REPORT NUMBER: SP1-2401-290-1

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/9/2023	2/9/2024
Power Meter	XITRON 2801 IN0071	10/23/2023	10/23/2024
AC Power Source	CHROMA 61603 IN0063	10/24/2023	10/24/2024
DC Power Source	AGILENT E3634A IN0208	10/24/2023	10/24/2024
Sphere Thermometer	ONSET IN0085	10/24/2023	10/24/2024
Room Thermometer	ONSET IN0046	10/24/2023	10/24/2024

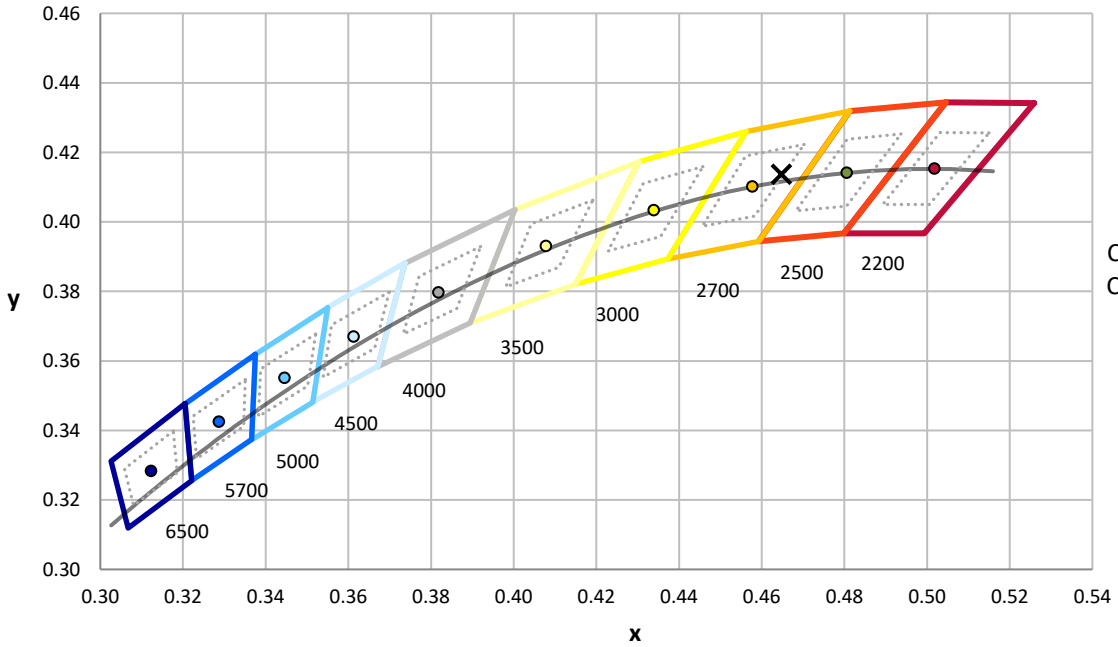
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

REPORT NUMBER: SP1-2401-290-1

CIE 1931 Chromaticity Diagram



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



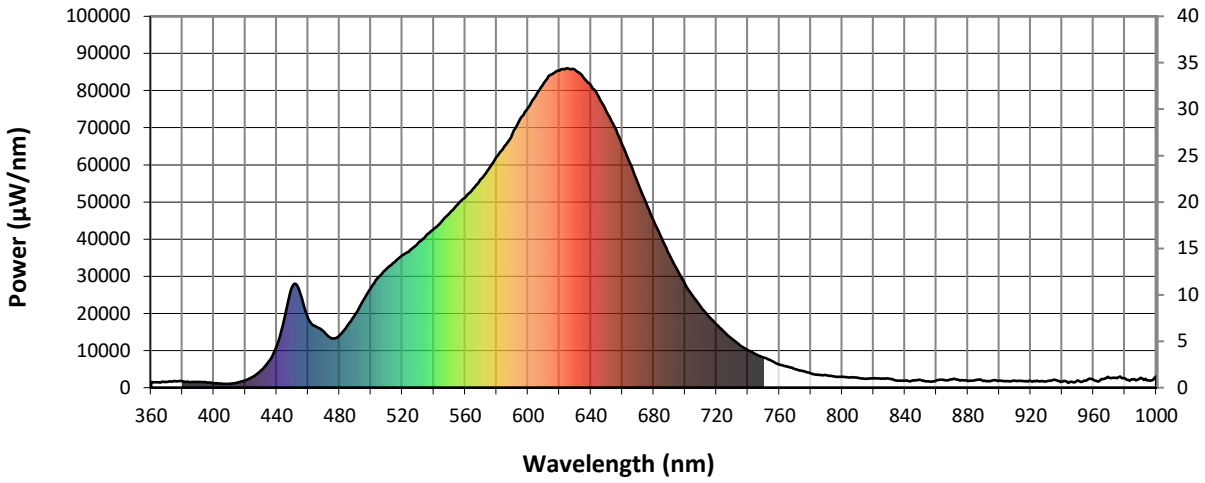
CCT = 2655K
CIE x = 0.4648
CIE y = 0.4137
Duv = 0.0008

Point lies inside the ANSI 2700K 4-step quadrangle

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

REPORT NUMBER: SP1-2401-290-1

Photopic Flux vs. Wavelength



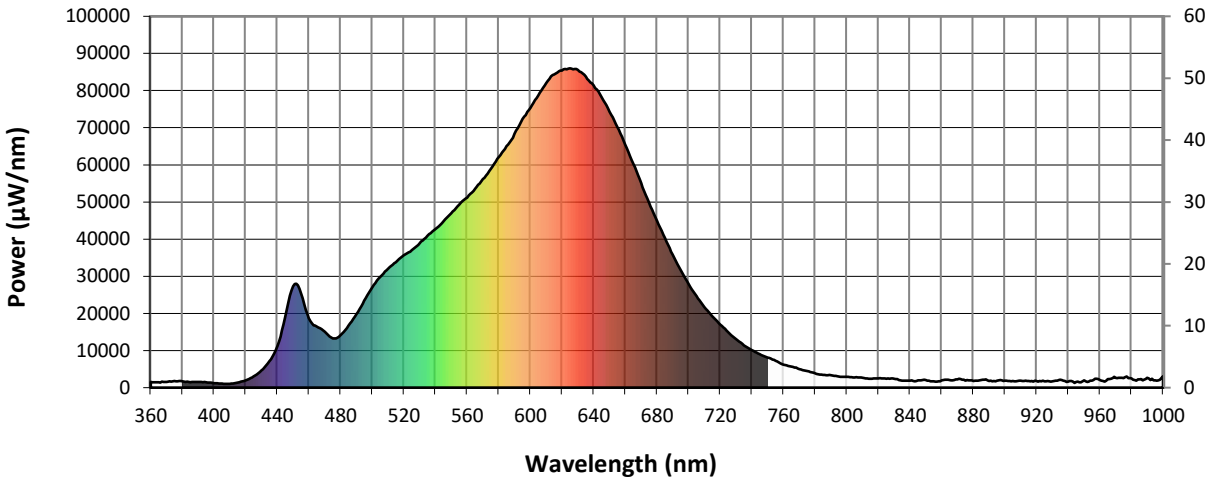
######

λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)
360	1543	NR	490	19797	NR	620	85353	NR	750	8090	NR	880	1792	NR
365	1414	NR	495	23402	NR	625	85989	NR	755	7198	NR	885	2020	NR
370	1551	NR	500	26949	NR	630	85515	NR	760	6225	NR	890	1828	NR
375	1796	NR	505	29825	NR	635	83747	NR	765	5688	NR	895	1860	NR
380	1726	NR	510	32000	NR	640	81402	NR	770	5021	NR	900	1911	NR
385	1466	NR	515	33805	NR	645	78259	NR	775	4504	NR	905	1780	NR
390	1558	NR	520	35652	NR	650	74273	NR	780	3834	NR	910	1898	NR
395	1442	NR	525	37021	NR	655	70182	NR	785	3465	NR	915	1803	NR
400	1203	NR	530	38939	NR	660	65368	NR	790	3329	NR	920	1835	NR
405	1067	NR	535	40941	NR	665	60328	NR	795	2970	NR	925	1737	NR
410	1017	NR	540	42696	NR	670	55011	NR	800	2874	NR	930	1738	NR
415	1324	NR	545	44809	NR	675	49838	NR	805	2736	NR	935	2125	NR
420	1972	NR	550	46959	NR	680	44927	NR	810	2648	NR	940	1637	NR
425	3033	NR	555	49260	NR	685	40277	NR	815	2400	NR	945	1569	NR
430	4609	NR	560	51165	NR	690	35795	NR	820	2470	NR	950	1938	NR
435	7105	NR	565	53562	NR	695	31683	NR	825	2425	NR	955	1864	NR
440	11197	NR	570	56177	NR	700	27880	NR	830	2392	NR	960	2093	NR
445	18973	NR	575	58898	NR	705	24664	NR	835	1867	NR	965	2277	NR
450	27311	NR	580	62115	NR	710	21670	NR	840	1912	NR	970	2629	NR
455	25348	NR	585	65028	NR	715	19241	NR	845	1927	NR	975	2541	NR
460	18677	NR	590	68395	NR	720	16927	NR	850	2066	NR	980	2508	NR
465	16400	NR	595	72374	NR	725	14936	NR	855	1671	NR	985	2238	NR
470	15032	NR	600	75401	NR	730	13104	NR	860	1946	NR	990	2619	NR
475	13281	NR	605	78653	NR	735	11394	NR	865	2045	NR	995	1965	NR
480	14079	NR	610	81994	NR	740	10108	NR	870	2206	NR	1000	3108	NR
485	16672	NR	615	84326	NR	745	9008	NR	875	1893	NR			

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

REPORT NUMBER: SP1-2401-290-1

Scotopic Flux vs. Wavelength



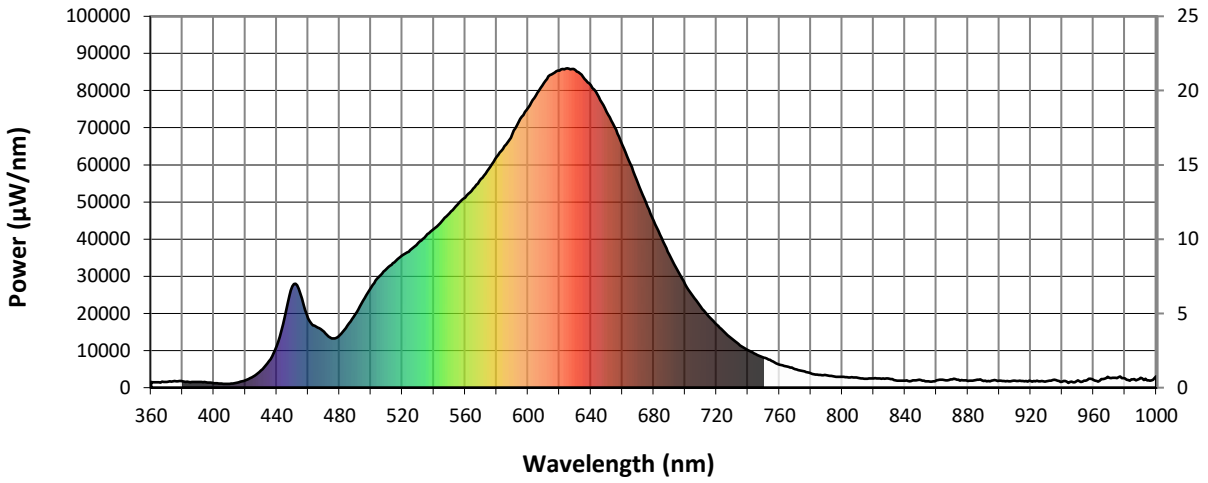
Scotopic Lumens: 4864.8 **S/P: 1.26**

λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)
360	1543	NR	490	19797	NR	620	85353	NR	750	8090	NR	880	1792	NR
365	1414	NR	495	23402	NR	625	85989	NR	755	7198	NR	885	2020	NR
370	1551	NR	500	26949	NR	630	85515	NR	760	6225	NR	890	1828	NR
375	1796	NR	505	29825	NR	635	83747	NR	765	5688	NR	895	1860	NR
380	1726	NR	510	32000	NR	640	81402	NR	770	5021	NR	900	1911	NR
385	1466	NR	515	33805	NR	645	78259	NR	775	4504	NR	905	1780	NR
390	1558	NR	520	35652	NR	650	74273	NR	780	3834	NR	910	1898	NR
395	1442	NR	525	37021	NR	655	70182	NR	785	3465	NR	915	1803	NR
400	1203	NR	530	38939	NR	660	65368	NR	790	3329	NR	920	1835	NR
405	1067	NR	535	40941	NR	665	60328	NR	795	2970	NR	925	1737	NR
410	1017	NR	540	42696	NR	670	55011	NR	800	2874	NR	930	1738	NR
415	1324	NR	545	44809	NR	675	49838	NR	805	2736	NR	935	2125	NR
420	1972	NR	550	46959	NR	680	44927	NR	810	2648	NR	940	1637	NR
425	3033	NR	555	49260	NR	685	40277	NR	815	2400	NR	945	1569	NR
430	4609	NR	560	51165	NR	690	35795	NR	820	2470	NR	950	1938	NR
435	7105	NR	565	53562	NR	695	31683	NR	825	2425	NR	955	1864	NR
440	11197	NR	570	56177	NR	700	27880	NR	830	2392	NR	960	2093	NR
445	18973	NR	575	58898	NR	705	24664	NR	835	1867	NR	965	2277	NR
450	27311	NR	580	62115	NR	710	21670	NR	840	1912	NR	970	2629	NR
455	25348	NR	585	65028	NR	715	19241	NR	845	1927	NR	975	2541	NR
460	18677	NR	590	68395	NR	720	16927	NR	850	2066	NR	980	2508	NR
465	16400	NR	595	72374	NR	725	14936	NR	855	1671	NR	985	2238	NR
470	15032	NR	600	75401	NR	730	13104	NR	860	1946	NR	990	2619	NR
475	13281	NR	605	78653	NR	735	11394	NR	865	2045	NR	995	1965	NR
480	14079	NR	610	81994	NR	740	10108	NR	870	2206	NR	1000	3108	NR
485	16672	NR	615	84326	NR	745	9008	NR	875	1893	NR			

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

REPORT NUMBER: SP1-2401-290-1

Melanopic Flux vs. Wavelength



Melanopic Lumens: 1804.6 **M/P: 0.47**

λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)	λ (nm)	Power (µW/nm)	Lumens (ϕ/nm)
360	1543	NR	490	19797	NR	620	85353	NR	750	8090	NR	880	1792	NR
365	1414	NR	495	23402	NR	625	85989	NR	755	7198	NR	885	2020	NR
370	1551	NR	500	26949	NR	630	85515	NR	760	6225	NR	890	1828	NR
375	1796	NR	505	29825	NR	635	83747	NR	765	5688	NR	895	1860	NR
380	1726	NR	510	32000	NR	640	81402	NR	770	5021	NR	900	1911	NR
385	1466	NR	515	33805	NR	645	78259	NR	775	4504	NR	905	1780	NR
390	1558	NR	520	35652	NR	650	74273	NR	780	3834	NR	910	1898	NR
395	1442	NR	525	37021	NR	655	70182	NR	785	3465	NR	915	1803	NR
400	1203	NR	530	38939	NR	660	65368	NR	790	3329	NR	920	1835	NR
405	1067	NR	535	40941	NR	665	60328	NR	795	2970	NR	925	1737	NR
410	1017	NR	540	42696	NR	670	55011	NR	800	2874	NR	930	1738	NR
415	1324	NR	545	44809	NR	675	49838	NR	805	2736	NR	935	2125	NR
420	1972	NR	550	46959	NR	680	44927	NR	810	2648	NR	940	1637	NR
425	3033	NR	555	49260	NR	685	40277	NR	815	2400	NR	945	1569	NR
430	4609	NR	560	51165	NR	690	35795	NR	820	2470	NR	950	1938	NR
435	7105	NR	565	53562	NR	695	31683	NR	825	2425	NR	955	1864	NR
440	11197	NR	570	56177	NR	700	27880	NR	830	2392	NR	960	2093	NR
445	18973	NR	575	58898	NR	705	24664	NR	835	1867	NR	965	2277	NR
450	27311	NR	580	62115	NR	710	21670	NR	840	1912	NR	970	2629	NR
455	25348	NR	585	65028	NR	715	19241	NR	845	1927	NR	975	2541	NR
460	18677	NR	590	68395	NR	720	16927	NR	850	2066	NR	980	2508	NR
465	16400	NR	595	72374	NR	725	14936	NR	855	1671	NR	985	2238	NR
470	15032	NR	600	75401	NR	730	13104	NR	860	1946	NR	990	2619	NR
475	13281	NR	605	78653	NR	735	11394	NR	865	2045	NR	995	1965	NR
480	14079	NR	610	81994	NR	740	10108	NR	870	2206	NR	1000	3108	NR
485	16672	NR	615	84326	NR	745	9008	NR	875	1893	NR			

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

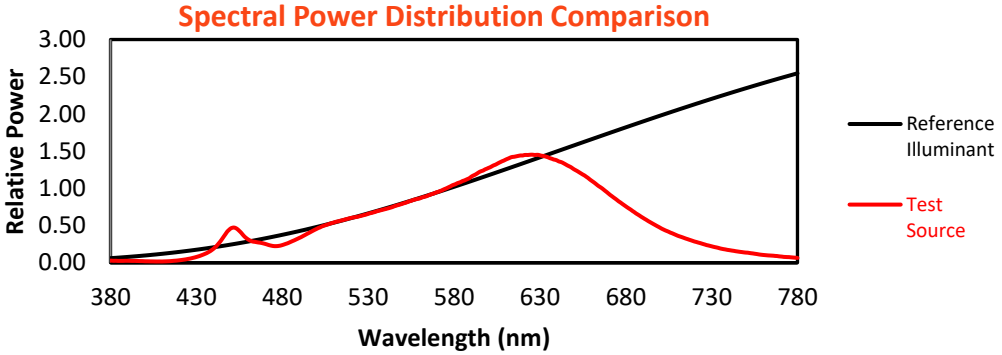
REPORT NUMBER: SP1-2401-290-1

TM-30-18

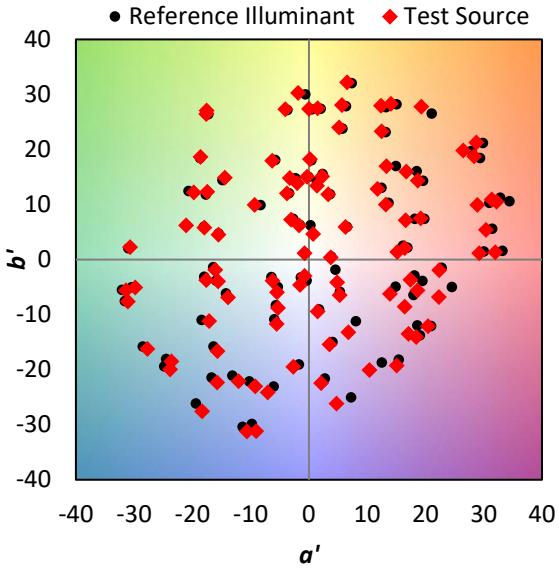
Summary

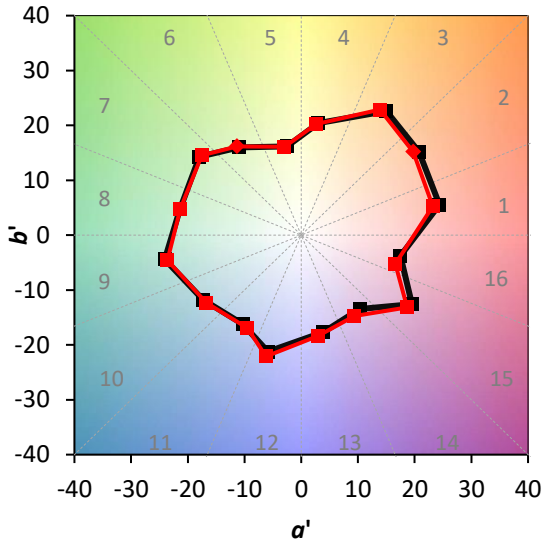
R_f = 93.2
R_g = 98.9
CIE R_a = 93.4
R_9 = 59.7

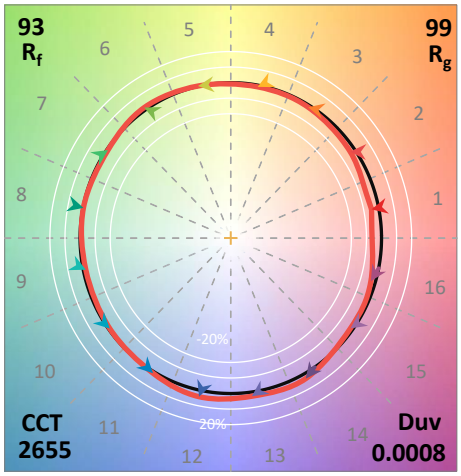
Spectral Power Distribution Comparison

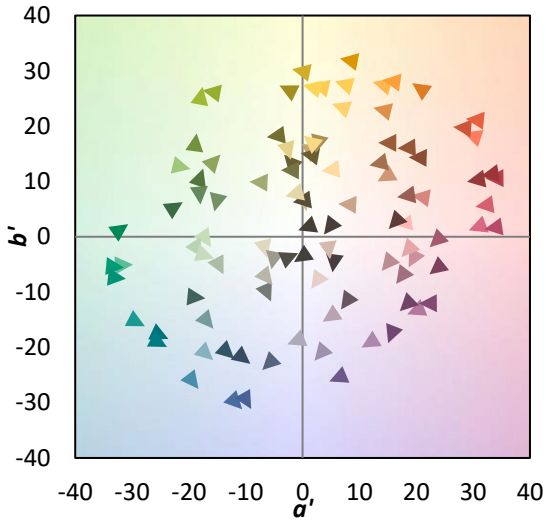


Color Vector Graphics









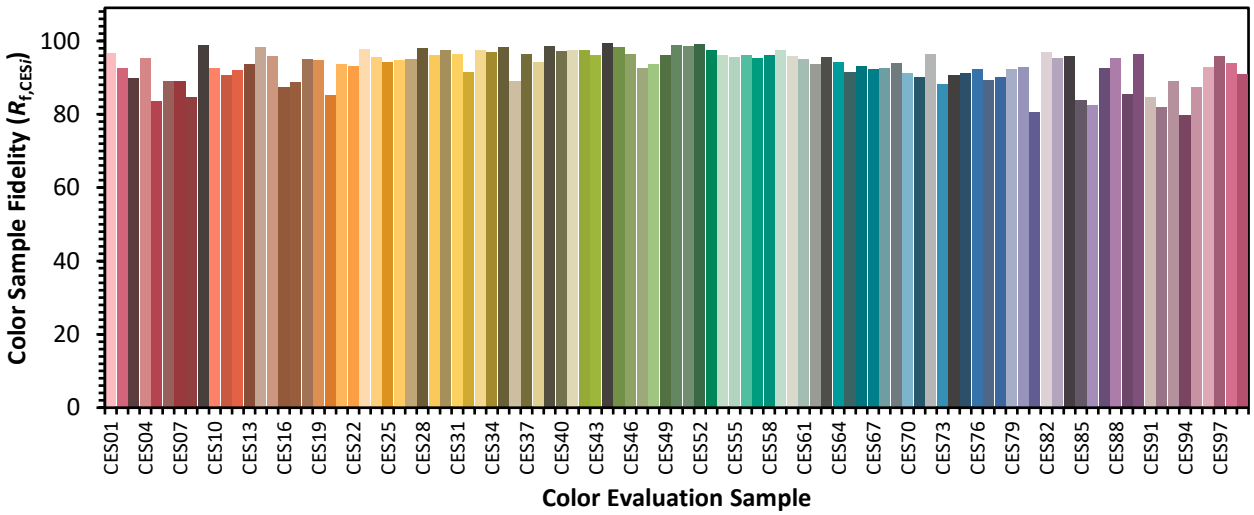
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

REPORT NUMBER: SP1-2401-290-1

TM-30-18

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

CES01 = 86	CES26 = 95	CES51 = 98	CES76 = 92
CES02 = 64	CES27 = 95	CES52 = 99	CES77 = 89
CES03 = 32	CES28 = 98	CES53 = 97	CES78 = 90
CES04 = 71	CES29 = 96	CES54 = 96	CES79 = 92
CES05 = 52	CES30 = 97	CES55 = 95	CES80 = 93
CES06 = 52	CES31 = 96	CES56 = 96	CES81 = 81
CES07 = 44	CES32 = 91	CES57 = 95	CES82 = 97
CES08 = 43	CES33 = 98	CES58 = 96	CES83 = 95
CES09 = 29	CES34 = 97	CES59 = 97	CES84 = 96
CES10 = 77	CES35 = 98	CES60 = 96	CES85 = 84
CES11 = 60	CES36 = 89	CES61 = 95	CES86 = 83
CES12 = 66	CES37 = 96	CES62 = 94	CES87 = 93
CES13 = 44	CES38 = 94	CES63 = 95	CES88 = 95
CES14 = 74	CES39 = 99	CES64 = 94	CES89 = 85
CES15 = 72	CES40 = 97	CES65 = 91	CES90 = 96
CES16 = 49	CES41 = 97	CES66 = 93	CES91 = 85
CES17 = 50	CES42 = 97	CES67 = 92	CES92 = 82
CES18 = 57	CES43 = 96	CES68 = 93	CES93 = 89
CES19 = 72	CES44 = 99	CES69 = 94	CES94 = 80
CES20 = 68	CES45 = 98	CES70 = 91	CES95 = 87
CES21 = 87	CES46 = 96	CES71 = 90	CES96 = 93
CES22 = 79	CES47 = 93	CES72 = 96	CES97 = 96
CES23 = 92	CES48 = 94	CES73 = 88	CES98 = 94
CES24 = 91	CES49 = 96	CES74 = 91	CES99 = 91
CES25 = 72	CES50 = 99	CES75 = 91	

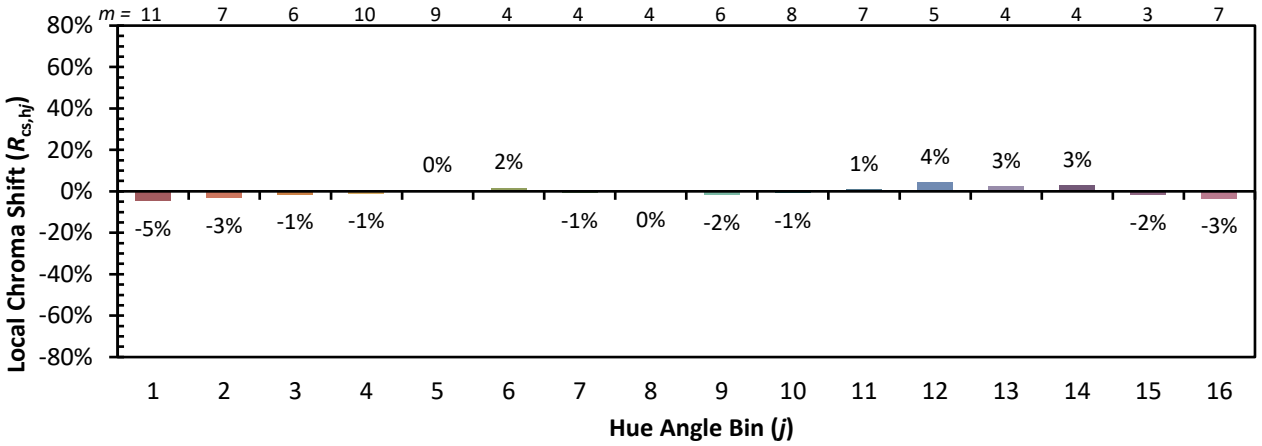


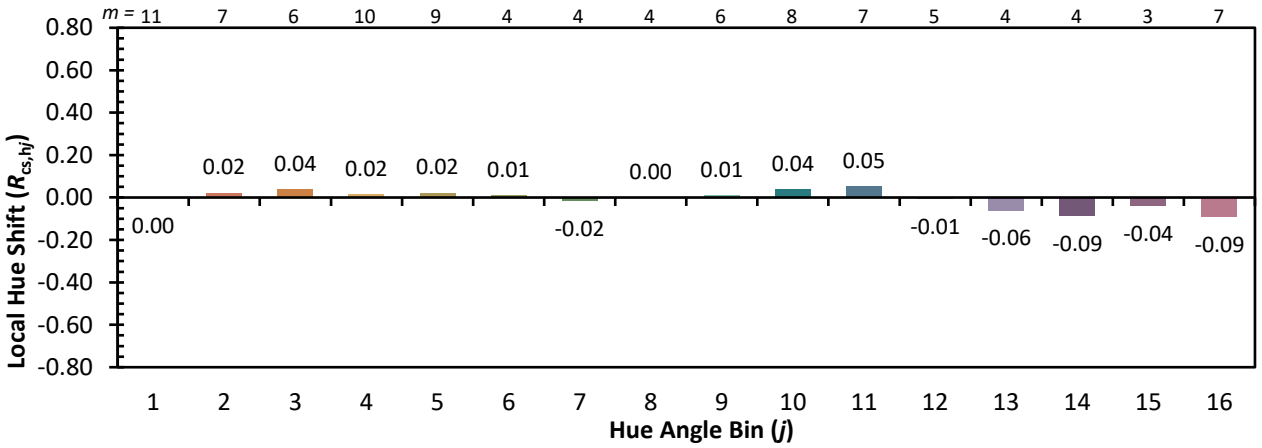
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

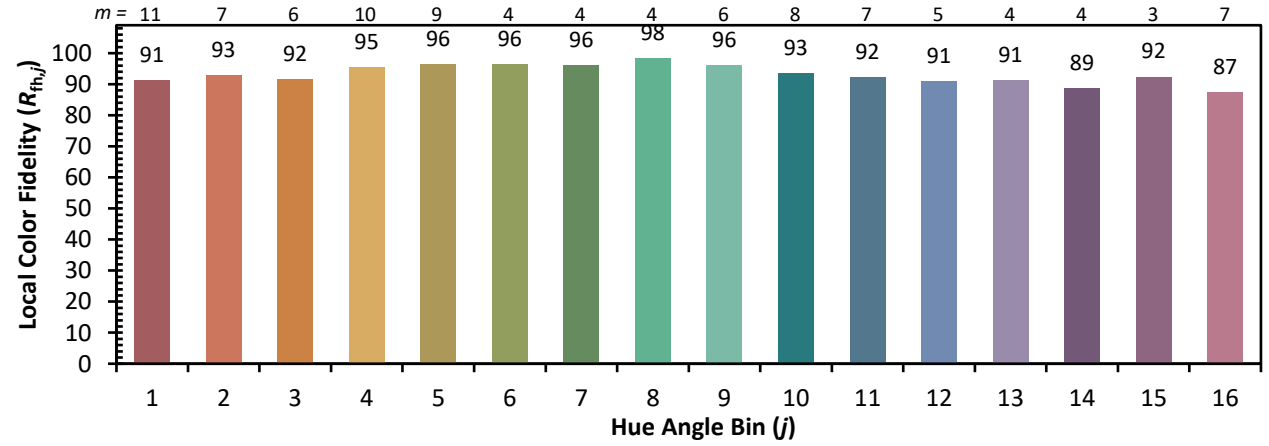
REPORT NUMBER: SP1-2401-290-1

TM-30-18

Color Rendition by Hue-Angle Bin





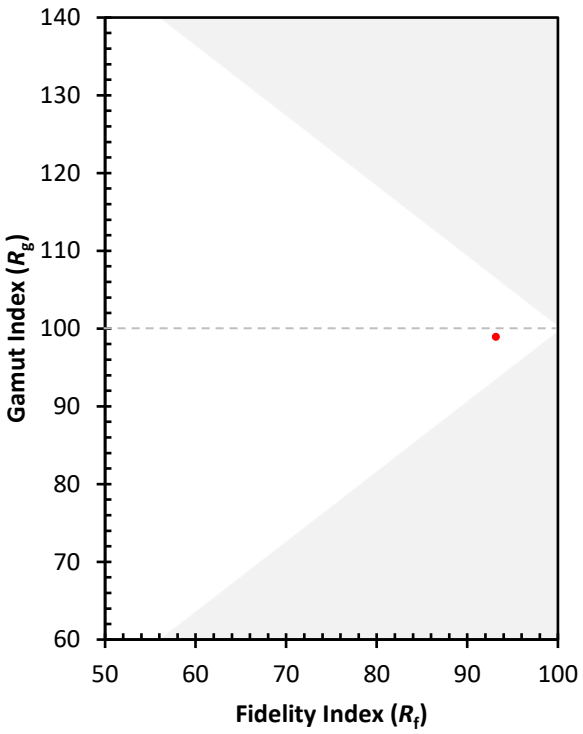


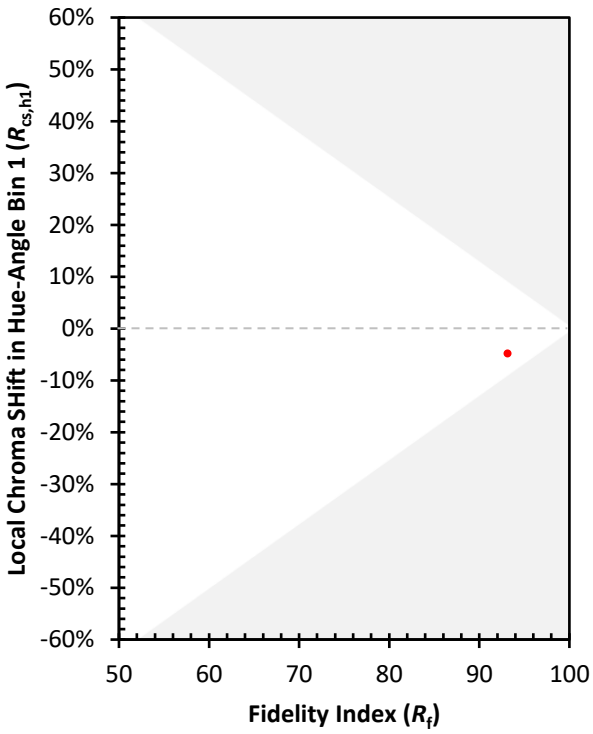
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

REPORT NUMBER: SP1-2401-290-1

TM-30-18

Measure Comparisons





(END OF REPORT)