

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: FAIL-SAFE

Report Number: P735642

Luminaire Tested: **4APN6-39-B2750-W2D-CP250-5000K**

Issue Date: 1/5/2024



Test Information

Test Method: LM-79-08
Report Number: P735642
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P709119)
Test Lab: INNOVATION CENTER(G2)
Issue Date: 1/5/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: 4APN6-39-B2750-W2D-CP250-5000K
Description: 4FT 3900 AMBIENT LUMEN OUTPUT APN WITH BIO UP LEDS AT 5000K CCT, AND CP250 LENS

Light Source: -
Ballast/Driver: -

Summary

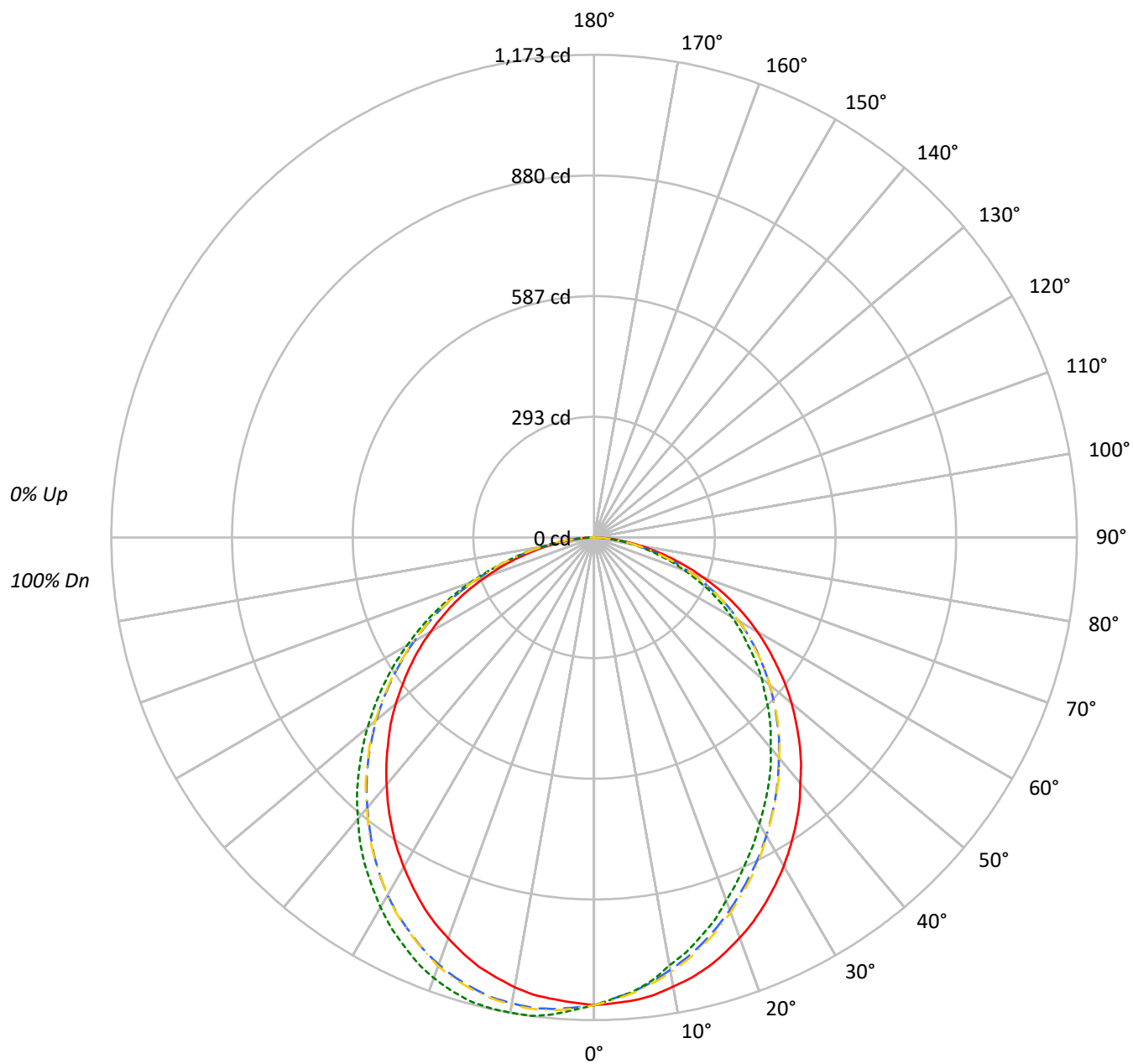
Lumens per Lamp: N/A
Luminaire Lumens: 3049.0 lumens
Efficiency: N/A
Efficacy: 62.1 lumens/watt
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.33
Luminous Opening: Rectangular (W 0.29' x L: 4' x H: 0')
CIE Type: Direct

Input Watts (W): 49.1
Input Voltage (V): NR
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

TEST NUMBER: P735642

CATALOG NUMBER: 4APN6-39-B2750-W2D-CP250-5000K

Luminous Intensity Polar Plot





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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20					20					20					20
RC	80				70					50					30					10
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100		
1	109	104	100	96	106	102	98	95	98	94	92	94	91	89	90	88	86	84		
2	99	91	84	78	96	89	83	77	85	80	76	82	78	74	79	76	72	70		
3	90	80	72	65	88	78	71	65	75	69	64	73	67	62	70	65	61	59		
4	83	71	62	55	81	70	61	55	67	60	54	65	59	54	63	57	53	51		
5	76	63	54	48	74	62	54	48	60	53	47	58	52	47	56	51	46	44		
6	70	57	48	42	68	56	48	42	54	47	41	53	46	41	51	45	41	38		
7	65	52	43	37	64	51	43	37	49	42	37	48	41	36	47	41	36	34		
8	61	47	39	33	59	47	39	33	45	38	33	44	37	33	43	37	32	30		
9	57	43	35	30	55	43	35	30	42	35	30	41	34	29	40	34	29	27		
10	53	40	32	27	52	40	32	27	39	32	27	38	31	27	37	31	27	25		

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°	270°
0°	10488	10488	10488	10488
5°	10458	10255	10434	10779
10°	10385	9891	10398	10987
15°	10306	9582	10319	11141
20°	10165	9218	10177	11187
25°	10002	8877	10041	11141
30°	9823	8563	9850	11056
35°	9618	8313	9660	10936
40°	9386	8038	9448	10749
45°	9212	7837	9230	10554
50°	8991	7623	9025	10317
55°	8709	7345	8770	10034
60°	8448	7119	8473	9682
65°	8112	6822	8112	9265
70°	7561	6315	7529	8638
75°	6876	5732	6784	7750
80°	5945	4920	5744	6631
85°	4637	3684	4361	5441



TEST NUMBER: P735642

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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	107.4	3.5
10°-20°	304.9	10.0
20°-30°	453.2	14.9
30°-40°	534.2	17.5
40°-50°	543.9	17.8
50°-60°	484.6	15.9
60°-70°	365.1	12.0
70°-80°	203.0	6.7
80°-90°	52.8	1.7
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°-30°	865.5	28.4
0°-40°	1399.7	45.9
0°-60°	2428.2	79.6
0°-90°	3049.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3049.0	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	1137	1137	1137	1137	1137	
5°	1129	1107	1127	1164	1129	107
15°	1079	1003	1080	1166	1079	304
25°	982	872	986	1094	982	453
35°	854	738	858	971	854	534
45°	706	601	707	809	706	544
55°	541	457	545	624	541	485
65°	372	312	372	424	372	367
75°	193	161	190	217	193	205
85°	44	35	41	51	44	53
90°	0	0	0	0	0	



TEST NUMBER: P735642

CATALOG NUMBER: 4APN6-39-B2750-W2D-CP250-5000K

CANDELA DISTRIBUTION (FULL):

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
0°	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8
2.5°	1133.0	1133.0	1134.2	1129.2	1122.7	1120.1	1118.9	1117.5	1120.1	1121.4	1120.1
5°	1129.2	1126.6	1124.0	1117.5	1109.9	1104.7	1102.1	1100.9	1103.5	1107.3	1103.5
7.5°	1121.4	1116.3	1111.1	1102.1	1093.2	1085.4	1081.6	1079.0	1081.6	1085.4	1082.8
10°	1108.5	1102.1	1094.4	1084.2	1071.3	1062.3	1058.4	1054.6	1055.8	1055.8	1055.8
12.5°	1095.6	1086.8	1077.7	1064.9	1050.6	1040.4	1033.9	1028.9	1031.3	1032.7	1032.7
15°	1079.0	1067.5	1054.6	1040.4	1026.3	1014.7	1007.0	1001.8	1003.2	1003.2	1004.4
17.5°	1058.4	1045.6	1032.7	1016.0	999.2	986.3	977.4	971.0	973.5	974.8	976.1
20°	1035.3	1021.1	1007.0	988.9	971.0	956.8	947.7	940.1	938.9	938.9	940.1
22.5°	1010.8	995.4	978.7	959.4	940.1	924.6	915.6	907.9	906.7	906.7	907.9
25°	982.5	965.8	949.1	929.8	909.2	893.9	882.2	874.6	873.2	872.0	874.6
27.5°	953.0	936.3	919.6	900.3	878.4	862.9	851.3	843.6	841.0	839.8	842.4
30°	922.0	902.7	884.8	864.1	844.9	829.5	817.9	808.9	806.4	803.8	806.4
32.5°	888.6	869.4	850.1	829.5	810.3	794.8	783.2	774.3	771.7	770.3	772.9
35°	853.9	834.6	816.7	796.0	776.7	761.4	749.8	742.1	739.5	738.1	739.5
37.5°	819.1	800.0	781.9	761.4	742.1	726.7	715.0	707.4	706.0	704.8	706.0
40°	779.3	762.6	744.6	725.3	706.0	690.7	681.6	672.6	670.0	667.4	671.4
42.5°	744.6	727.9	710.0	691.9	672.6	657.1	646.9	639.2	636.6	635.2	636.6
45°	706.0	688.1	670.0	653.3	635.2	621.2	610.9	603.1	601.9	600.6	601.9
47.5°	665.0	649.5	634.0	617.3	599.3	585.2	576.1	568.5	565.9	563.3	565.9
50°	626.4	610.9	595.4	580.0	563.3	550.4	541.4	533.7	532.4	531.1	532.4
52.5°	585.2	569.7	555.6	540.2	525.9	513.1	504.2	497.8	496.4	495.2	496.4
55°	541.4	528.5	515.7	502.8	488.7	477.1	469.4	461.6	459.2	456.6	459.2
57.5°	500.2	488.7	475.9	463.0	450.1	439.9	432.1	425.6	424.4	423.0	424.4
60°	457.8	447.5	435.9	424.4	411.6	401.3	394.9	389.7	387.1	385.8	387.1
62.5°	415.4	405.1	396.1	384.5	373.0	365.2	358.7	353.7	351.1	349.9	351.1
65°	371.6	362.7	353.7	343.4	334.4	326.6	320.2	315.1	313.7	312.5	312.5
67.5°	326.6	318.9	311.3	302.2	292.0	284.2	277.7	273.9	272.7	271.3	272.7
70°	280.3	273.9	266.3	258.4	250.8	244.4	240.5	236.7	235.3	234.1	234.1
72.5°	236.7	231.5	225.1	218.6	212.2	205.8	202.0	199.3	198.1	196.7	196.7
75°	192.9	187.7	183.9	178.8	172.4	168.4	164.6	162.0	160.8	160.8	160.8
77.5°	151.7	147.9	144.1	138.9	135.0	131.2	128.6	127.4	126.0	126.0	126.0
80°	111.9	109.3	106.7	104.1	100.3	96.5	95.2	93.9	92.6	92.6	92.6
82.5°	75.9	74.6	72.0	69.5	66.9	65.5	64.3	63.1	63.1	63.1	63.1
85°	43.8	42.4	41.2	39.8	38.6	38.6	37.4	36.0	34.8	34.8	34.8
87.5°	18.1	18.1	18.1	16.7	15.5	15.5	15.5	15.5	15.5	15.5	15.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P735642

CATALOG NUMBER: 4APN6-39-B2750-W2D-CP250-5000K

CANDELA DISTRIBUTION (continued):

	110°	120°	130°	140°	150°	160°	170°	180°	190°	200°	210°
0°	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8
2.5°	1117.5	1120.1	1122.7	1126.6	1130.4	1134.2	1133.0	1131.8	1136.8	1143.3	1144.6
5°	1100.9	1103.5	1107.3	1113.7	1120.1	1125.4	1126.6	1126.6	1136.8	1145.9	1148.5
7.5°	1080.3	1084.2	1089.2	1095.6	1104.7	1112.5	1116.3	1121.4	1131.8	1143.3	1148.5
10°	1054.6	1061.0	1068.7	1077.7	1086.8	1095.6	1103.5	1109.9	1122.7	1135.6	1143.3
12.5°	1031.3	1037.8	1045.6	1055.8	1067.5	1079.0	1086.8	1095.6	1111.1	1126.6	1135.6
15°	1005.6	1012.1	1021.1	1031.3	1044.2	1057.1	1068.7	1080.3	1095.6	1112.5	1122.7
17.5°	977.4	983.9	992.8	1005.6	1019.9	1033.9	1046.8	1059.7	1077.7	1095.6	1107.3
20°	942.7	951.7	963.2	976.1	992.8	1009.6	1022.5	1036.5	1055.8	1075.1	1088.0
22.5°	909.2	918.2	931.1	946.5	964.6	982.5	998.0	1013.4	1033.9	1053.2	1067.5
25°	877.0	887.4	900.3	915.6	932.4	950.3	968.4	986.3	1007.0	1027.5	1041.8
27.5°	844.9	853.9	866.8	882.2	901.5	919.6	937.5	955.6	977.4	999.2	1014.7
30°	808.9	819.1	830.8	846.2	866.8	887.4	905.3	924.6	946.5	968.4	983.9
32.5°	775.5	784.5	796.0	811.5	832.0	852.7	872.0	892.5	913.1	934.9	950.3
35°	742.1	751.0	762.6	778.1	798.6	819.1	838.4	857.7	878.4	898.9	914.4
37.5°	708.6	717.6	729.3	744.6	763.9	784.5	802.4	821.7	842.4	862.9	877.0
40°	673.8	682.9	691.9	707.4	726.7	747.2	765.2	784.5	805.0	825.6	839.8
42.5°	639.2	648.1	659.7	675.2	693.1	711.2	729.3	747.2	766.5	785.8	800.0
45°	604.5	612.1	623.8	637.9	655.9	672.6	690.7	707.4	726.7	744.6	758.8
47.5°	568.5	576.1	585.2	599.3	617.3	635.2	653.3	670.0	686.7	704.8	717.6
50°	533.7	541.4	551.7	564.5	581.4	598.0	613.5	628.8	645.7	662.4	673.8
52.5°	497.8	505.4	514.4	527.3	541.4	556.9	570.9	586.4	601.9	617.3	628.8
55°	461.6	466.8	474.5	486.1	501.6	517.0	531.1	545.2	559.5	572.3	583.8
57.5°	425.6	432.1	441.1	451.4	464.2	477.1	489.9	502.8	515.7	528.5	538.8
60°	389.7	394.9	401.3	410.2	423.0	434.7	447.5	459.2	470.7	482.3	491.3
62.5°	352.3	357.5	363.9	373.0	383.2	393.5	405.1	415.4	425.6	435.9	444.9
65°	313.7	318.9	325.4	333.0	342.0	351.1	361.3	371.6	379.4	387.1	396.1
67.5°	273.9	279.1	285.5	292.0	299.6	308.7	317.7	326.6	334.4	342.0	348.5
70°	235.3	239.2	245.6	250.8	257.2	263.7	271.3	279.1	284.2	290.6	298.4
72.5°	198.1	202.0	207.0	212.2	216.0	221.2	228.9	235.3	241.8	249.6	253.4
75°	162.0	164.6	168.4	172.4	176.2	180.1	185.3	190.3	195.5	199.3	204.6
77.5°	126.0	128.6	132.4	135.0	137.6	140.2	144.1	147.9	151.7	154.3	159.5
80°	92.6	95.2	97.7	100.3	102.9	105.5	106.7	108.1	113.1	117.0	119.6
82.5°	63.1	64.3	65.5	68.1	69.5	70.7	72.0	72.0	74.6	77.2	81.0
85°	36.0	37.4	38.6	38.6	38.6	38.6	39.8	41.2	42.4	45.0	47.6
87.5°	14.1	14.1	15.5	15.5	15.5	15.5	15.5	15.5	16.7	19.3	20.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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CANDELA DISTRIBUTION (continued):

	220°	230°	240°	250°	260°	270°	280°	290°	300°	310°	320°
0°	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8	1136.8
2.5°	1143.3	1144.6	1147.1	1148.5	1149.7	1149.7	1151.1	1152.3	1149.7	1147.1	1145.9
5°	1149.7	1151.1	1154.9	1158.7	1161.3	1163.9	1162.6	1161.3	1158.7	1154.9	1152.3
7.5°	1151.1	1154.9	1158.7	1163.9	1167.8	1172.8	1170.4	1167.8	1162.6	1157.5	1153.5
10°	1147.1	1152.3	1158.7	1165.2	1169.0	1172.8	1170.4	1167.8	1162.6	1156.1	1151.1
12.5°	1142.0	1148.5	1156.1	1162.6	1166.4	1171.6	1167.8	1163.9	1157.5	1151.1	1144.6
15°	1130.4	1138.2	1147.1	1154.9	1161.3	1166.4	1162.6	1160.0	1152.3	1143.3	1134.2
17.5°	1116.3	1126.6	1135.6	1144.6	1149.7	1154.9	1152.3	1149.7	1140.7	1130.4	1120.1
20°	1099.6	1109.9	1118.9	1127.8	1134.2	1139.4	1135.6	1131.8	1122.7	1113.7	1103.5
22.5°	1079.0	1089.2	1099.6	1108.5	1114.9	1120.1	1114.9	1108.5	1099.6	1090.6	1080.3
25°	1053.2	1064.9	1076.4	1085.4	1089.2	1094.4	1089.2	1084.2	1075.1	1066.1	1054.6
27.5°	1027.5	1039.2	1050.6	1059.7	1063.5	1068.7	1063.5	1058.4	1049.4	1040.4	1028.9
30°	998.0	1009.6	1021.1	1030.1	1033.9	1037.8	1032.7	1027.5	1019.9	1010.8	999.2
32.5°	964.6	976.1	985.1	994.1	999.2	1004.4	999.2	995.4	986.3	974.8	963.2
35°	928.5	940.1	951.7	960.6	965.8	971.0	964.6	958.2	950.3	941.3	931.1
37.5°	888.6	901.5	914.4	924.6	928.5	933.7	928.5	922.0	914.4	905.3	893.9
40°	851.3	862.9	874.6	884.8	888.6	892.5	887.4	882.2	873.2	864.1	852.7
42.5°	812.9	824.3	834.6	843.6	847.5	852.7	847.5	841.0	834.6	826.9	816.7
45°	771.7	783.2	792.2	801.2	805.0	808.9	803.8	797.4	791.0	784.5	774.3
47.5°	729.3	739.5	748.6	757.4	760.0	763.9	758.8	755.0	748.6	742.1	733.1
50°	685.5	695.7	704.8	712.4	715.0	718.8	713.8	708.6	703.5	698.3	690.7
52.5°	640.5	649.5	658.5	666.2	668.8	671.4	666.2	661.0	655.9	650.7	643.1
55°	594.2	603.1	612.1	618.6	621.2	623.8	618.6	614.7	609.5	605.7	598.0
57.5°	547.8	556.9	564.5	570.9	573.5	576.1	570.9	565.9	562.1	558.1	551.7
60°	500.2	509.2	515.7	520.9	523.5	524.7	519.5	515.7	513.1	510.6	504.2
62.5°	454.0	460.4	466.8	470.7	473.3	474.5	470.7	468.1	465.6	463.0	457.8
65°	405.1	412.8	418.0	421.8	423.0	424.4	420.6	418.0	415.4	412.8	409.0
67.5°	356.3	362.7	366.5	370.4	371.6	371.6	371.6	370.4	367.8	363.9	360.1
70°	307.3	312.5	316.3	318.9	320.2	320.2	317.7	315.1	315.1	313.7	311.3
72.5°	257.2	261.1	263.7	266.3	266.3	266.3	266.3	267.5	266.3	263.7	259.8
75°	209.6	213.4	216.0	217.4	217.4	217.4	217.4	218.6	217.4	216.0	213.4
77.5°	164.6	167.2	168.4	169.8	169.8	169.8	171.0	172.4	171.0	169.8	168.4
80°	122.2	123.4	124.8	126.0	124.8	124.8	126.0	128.6	127.4	126.0	124.8
82.5°	83.6	84.8	86.2	86.2	87.4	88.8	88.8	88.8	88.8	87.4	86.2
85°	50.2	51.4	51.4	51.4	51.4	51.4	52.7	54.0	54.0	52.7	52.7
87.5°	23.1	24.5	23.1	21.9	20.5	20.5	23.1	25.7	25.7	24.5	24.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P735642

CATALOG NUMBER: 4APN6-39-B2750-W2D-CP250-5000K

CANDELA DISTRIBUTION (continued):

	330°	340°	350°	360°
0°	1136.8	1136.8	1136.8	1136.8
2.5°	1147.1	1145.9	1139.4	1133.0
5°	1151.1	1147.1	1138.2	1129.2
7.5°	1151.1	1145.9	1133.0	1121.4
10°	1144.6	1136.8	1122.7	1108.5
12.5°	1136.8	1127.8	1111.1	1095.6
15°	1125.4	1114.9	1097.0	1079.0
17.5°	1108.5	1095.6	1077.7	1058.4
20°	1091.8	1077.7	1055.8	1035.3
22.5°	1068.7	1055.8	1032.7	1010.8
25°	1043.0	1028.9	1005.6	982.5
27.5°	1016.0	999.2	976.1	953.0
30°	985.1	968.4	945.3	922.0
32.5°	951.7	936.3	913.1	888.6
35°	918.2	901.5	878.4	853.9
37.5°	881.0	865.5	842.4	819.1
40°	841.0	825.6	802.4	779.3
42.5°	803.8	789.6	766.5	744.6
45°	762.6	748.6	726.7	706.0
47.5°	720.2	706.0	685.5	665.0
50°	679.0	665.0	645.7	626.4
52.5°	632.8	621.2	603.1	585.2
55°	587.8	576.1	558.1	541.4
57.5°	542.8	532.4	515.7	500.2
60°	495.2	484.9	472.0	457.8
62.5°	450.1	441.1	428.2	415.4
65°	402.5	394.9	383.2	371.6
67.5°	353.7	347.3	337.0	326.6
70°	304.8	297.0	289.4	280.3
72.5°	256.0	252.0	244.4	236.7
75°	209.6	205.8	199.3	192.9
77.5°	166.0	162.0	156.9	151.7
80°	122.2	119.6	115.8	111.9
82.5°	84.8	82.4	79.8	75.9
85°	51.4	48.8	46.2	43.8
87.5°	23.1	21.9	19.3	18.1
90°	0.0	0.0	0.0	0.0



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180° - - 45°-225° - - - - 90°-270° - · - 135°-315°













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

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

METALUX

Report Number: SP1-2210-795-5

Test Date: 10/06/2022

Luminaire Tested: 9WP217084MDER4AM-5000K-315MA

Data in this report applies to families of products including 9WP217084MDER4AM-5000K.

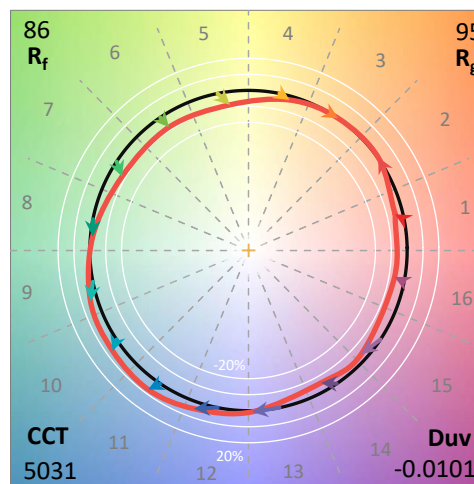
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2210-795-5
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/06/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: METALUX
 Catalog Number: **9WP217084MDER4AM-5000K-315MA**
 Description: METALUX

TUNABLE BOARD, 5000K-315MA, PROGRAMMED @ 6.5Vdc.

Spectral Parameters

CCT (K):	5031	CRI (Ra):	84.5		
CIE u':	0.2182	R1:	91.8	R9:	77.5
CIE v':	0.4734	R2:	85.4	R10:	70.0
Duv:	-0.0101	R3:	79.8	R11:	87.5
CIE x:	0.3424	R4:	86.6	R12:	69.3
CIE y:	0.3302	R5:	89.4	R13:	89.5
CIE z:	0.3273	R6:	79.4	R14:	89.8
Peak Wavelength (nm):	476	R7:	81.5		
Dominant Wavelength (nm):	495	R8:	82.5		
Purity:	3.1				
Rf:	85.9				
Rg:	94.8				



Test Conditions

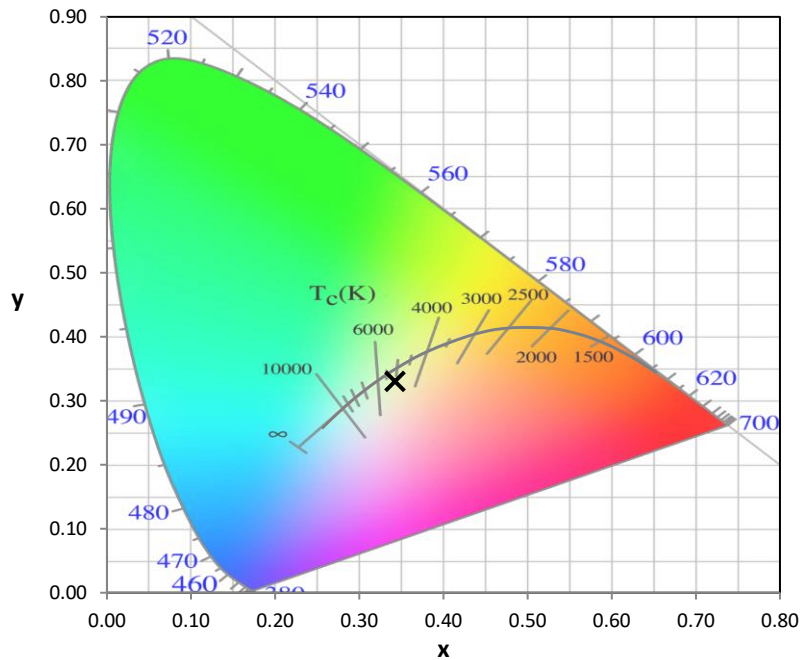
Stabilization Time: 58M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 24.0/38%
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2210-795-5

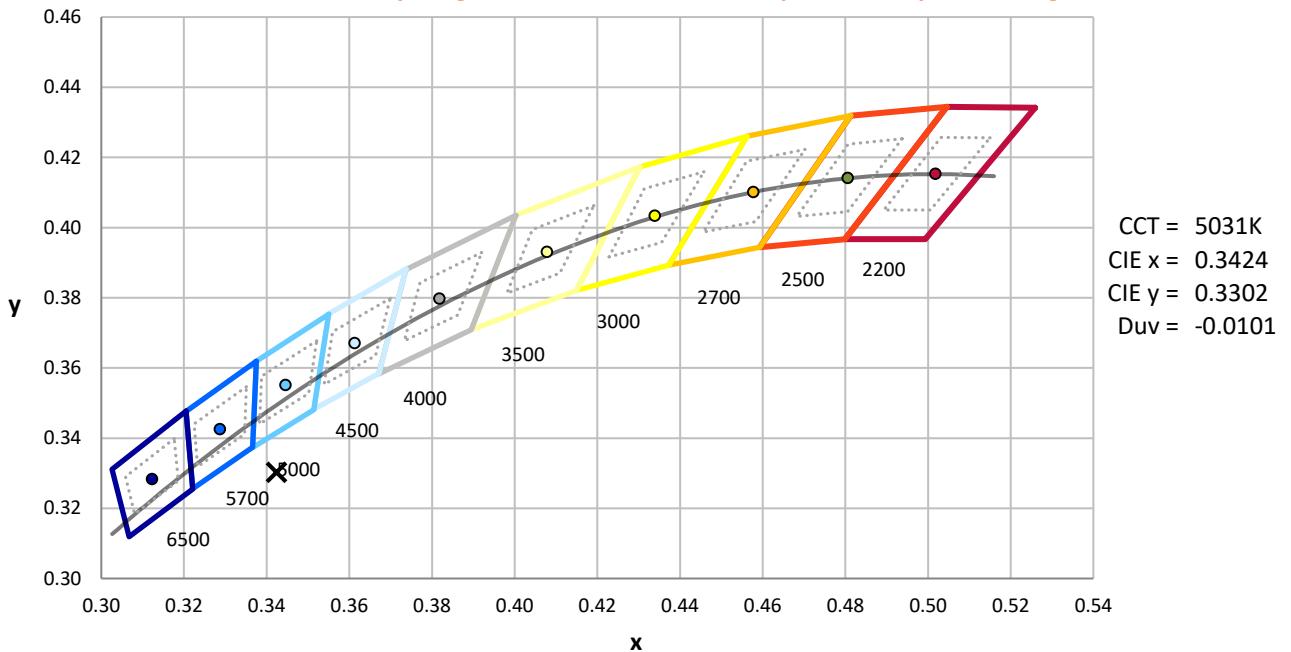
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/8/2022	2/8/2023
Power Meter	XITRON 2801 IN0071	11/29/2021	11/29/2022
AC Power Source	CHROMA 61603 IN0063	11/29/2021	11/29/2022
DC Power Source	AGILENT E3634A IN0208	11/29/2021	11/29/2022
Sphere Thermometer	ONSET IN0085	11/29/2021	11/29/2022
Room Thermometer	ONSET IN0046	11/29/2021	11/29/2022

REPORT NUMBER: SP1-2210-795-5

CIE 1931 Chromaticity Diagram



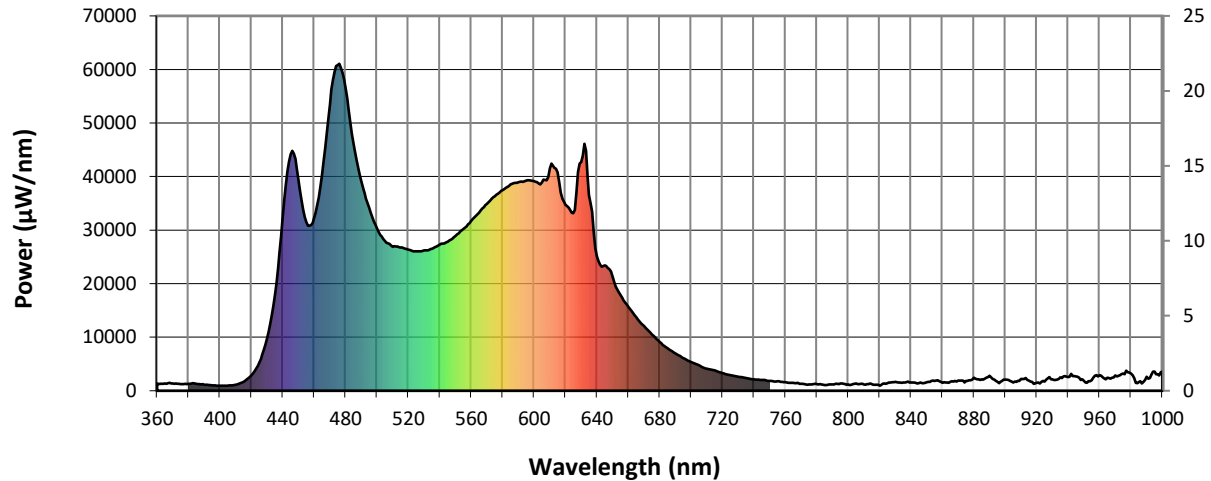
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies outside the range

REPORT NUMBER: SP1-2210-795-5

Photopic Flux vs. Wavelength

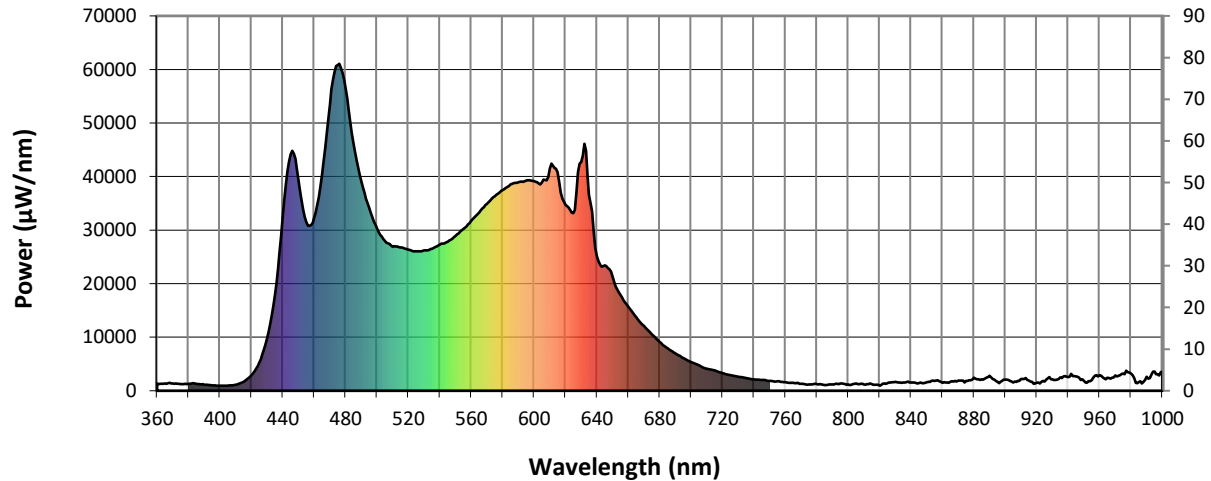


#####

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	1378	NR	490	39050	NR	620	34698	NR	750	1822	NR	880	2439	NR
365	1331	NR	495	34202	NR	625	33140	NR	755	1777	NR	885	2149	NR
370	1335	NR	500	30309	NR	630	42721	NR	760	1599	NR	890	2769	NR
375	1253	NR	505	28003	NR	635	36567	NR	765	1448	NR	895	1685	NR
380	1292	NR	510	26874	NR	640	25112	NR	770	1318	NR	900	2065	NR
385	1298	NR	515	26736	NR	645	23382	NR	775	1208	NR	905	1550	NR
390	1143	NR	520	26353	NR	650	21346	NR	780	1268	NR	910	2207	NR
395	1012	NR	525	26016	NR	655	17849	NR	785	1072	NR	915	1905	NR
400	913	NR	530	26219	NR	660	15701	NR	790	1151	NR	920	1492	NR
405	948	NR	535	26516	NR	665	13709	NR	795	1361	NR	925	1709	NR
410	1112	NR	540	27283	NR	670	12105	NR	800	1152	NR	930	2138	NR
415	1681	NR	545	27836	NR	675	10522	NR	805	1330	NR	935	2497	NR
420	2833	NR	550	28917	NR	680	9121	NR	810	1205	NR	940	2581	NR
425	5230	NR	555	30224	NR	685	7915	NR	815	1233	NR	945	2662	NR
430	9705	NR	560	31691	NR	690	6967	NR	820	960	NR	950	1809	NR
435	17926	NR	565	33290	NR	695	6106	NR	825	1423	NR	955	1977	NR
440	32347	NR	570	34911	NR	700	5390	NR	830	1655	NR	960	2906	NR
445	44160	NR	575	36327	NR	705	4734	NR	835	1541	NR	965	2456	NR
450	39460	NR	580	37455	NR	710	4108	NR	840	1555	NR	970	2874	NR
455	31448	NR	585	38519	NR	715	3797	NR	845	1414	NR	975	3194	NR
460	32233	NR	590	38974	NR	720	3287	NR	850	1598	NR	980	3237	NR
465	40342	NR	595	39274	NR	725	2926	NR	855	1852	NR	985	1591	NR
470	53556	NR	600	39138	NR	730	2611	NR	860	1463	NR	990	2611	NR
475	60829	NR	605	38865	NR	735	2376	NR	865	1656	NR	995	3556	NR
480	56377	NR	610	41532	NR	740	2107	NR	870	1883	NR	1000	3556	NR
485	46320	NR	615	40776	NR	745	2023	NR	875	1818	NR			

REPORT NUMBER: SP1-2210-795-5

Scotopic Flux vs. Wavelength



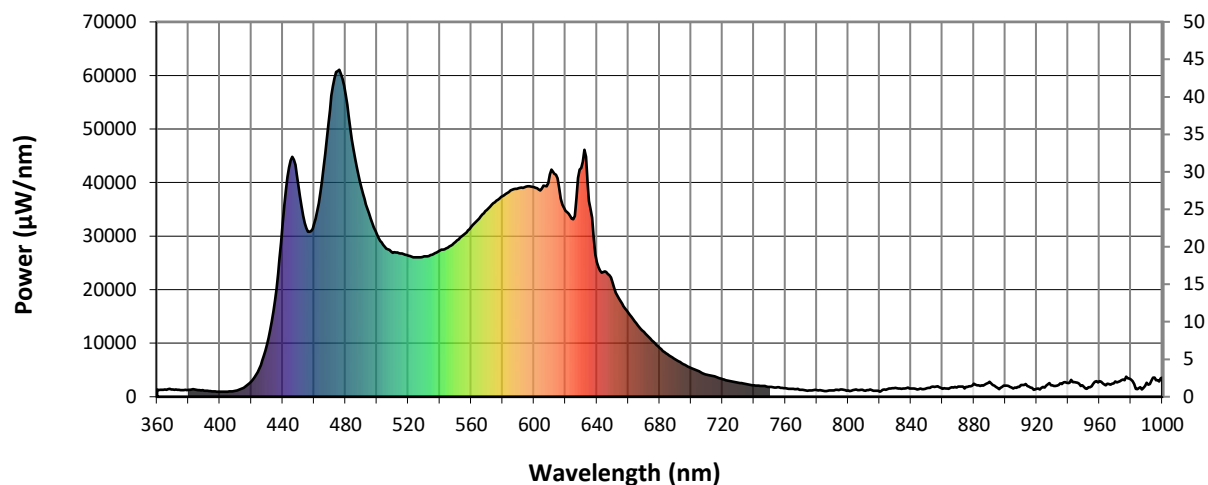
Scotopic Lumens: 5560

S/P: 2.33

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	1378	NR	490	39050	NR	620	34698	NR	750	1822	NR	880	2439	NR
365	1331	NR	495	34202	NR	625	33140	NR	755	1777	NR	885	2149	NR
370	1335	NR	500	30309	NR	630	42721	NR	760	1599	NR	890	2769	NR
375	1253	NR	505	28003	NR	635	36567	NR	765	1448	NR	895	1685	NR
380	1292	NR	510	26874	NR	640	25112	NR	770	1318	NR	900	2065	NR
385	1298	NR	515	26736	NR	645	23382	NR	775	1208	NR	905	1550	NR
390	1143	NR	520	26353	NR	650	21346	NR	780	1268	NR	910	2207	NR
395	1012	NR	525	26016	NR	655	17849	NR	785	1072	NR	915	1905	NR
400	913	NR	530	26219	NR	660	15701	NR	790	1151	NR	920	1492	NR
405	948	NR	535	26516	NR	665	13709	NR	795	1361	NR	925	1709	NR
410	1112	NR	540	27283	NR	670	12105	NR	800	1152	NR	930	2138	NR
415	1681	NR	545	27836	NR	675	10522	NR	805	1330	NR	935	2497	NR
420	2833	NR	550	28917	NR	680	9121	NR	810	1205	NR	940	2581	NR
425	5230	NR	555	30224	NR	685	7915	NR	815	1233	NR	945	2662	NR
430	9705	NR	560	31691	NR	690	6967	NR	820	960	NR	950	1809	NR
435	17926	NR	565	33290	NR	695	6106	NR	825	1423	NR	955	1977	NR
440	32347	NR	570	34911	NR	700	5390	NR	830	1655	NR	960	2906	NR
445	44160	NR	575	36327	NR	705	4734	NR	835	1541	NR	965	2456	NR
450	39460	NR	580	37455	NR	710	4108	NR	840	1555	NR	970	2874	NR
455	31448	NR	585	38519	NR	715	3797	NR	845	1414	NR	975	3194	NR
460	32233	NR	590	38974	NR	720	3287	NR	850	1598	NR	980	3237	NR
465	40342	NR	595	39274	NR	725	2926	NR	855	1852	NR	985	1591	NR
470	53556	NR	600	39138	NR	730	2611	NR	860	1463	NR	990	2611	NR
475	60829	NR	605	38865	NR	735	2376	NR	865	1656	NR	995	3556	NR
480	56377	NR	610	41532	NR	740	2107	NR	870	1883	NR	1000	3556	NR
485	46320	NR	615	40776	NR	745	2023	NR	875	1818	NR			

REPORT NUMBER: SP1-2210-795-5

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2561.9

S/P: 1.07

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	1378	NR	490	39050	NR	620	34698	NR	750	1822	NR	880	2439	NR
365	1331	NR	495	34202	NR	625	33140	NR	755	1777	NR	885	2149	NR
370	1335	NR	500	30309	NR	630	42721	NR	760	1599	NR	890	2769	NR
375	1253	NR	505	28003	NR	635	36567	NR	765	1448	NR	895	1685	NR
380	1292	NR	510	26874	NR	640	25112	NR	770	1318	NR	900	2065	NR
385	1298	NR	515	26736	NR	645	23382	NR	775	1208	NR	905	1550	NR
390	1143	NR	520	26353	NR	650	21346	NR	780	1268	NR	910	2207	NR
395	1012	NR	525	26016	NR	655	17849	NR	785	1072	NR	915	1905	NR
400	913	NR	530	26219	NR	660	15701	NR	790	1151	NR	920	1492	NR
405	948	NR	535	26516	NR	665	13709	NR	795	1361	NR	925	1709	NR
410	1112	NR	540	27283	NR	670	12105	NR	800	1152	NR	930	2138	NR
415	1681	NR	545	27836	NR	675	10522	NR	805	1330	NR	935	2497	NR
420	2833	NR	550	28917	NR	680	9121	NR	810	1205	NR	940	2581	NR
425	5230	NR	555	30224	NR	685	7915	NR	815	1233	NR	945	2662	NR
430	9705	NR	560	31691	NR	690	6967	NR	820	960	NR	950	1809	NR
435	17926	NR	565	33290	NR	695	6106	NR	825	1423	NR	955	1977	NR
440	32347	NR	570	34911	NR	700	5390	NR	830	1655	NR	960	2906	NR
445	44160	NR	575	36327	NR	705	4734	NR	835	1541	NR	965	2456	NR
450	39460	NR	580	37455	NR	710	4108	NR	840	1555	NR	970	2874	NR
455	31448	NR	585	38519	NR	715	3797	NR	845	1414	NR	975	3194	NR
460	32233	NR	590	38974	NR	720	3287	NR	850	1598	NR	980	3237	NR
465	40342	NR	595	39274	NR	725	2926	NR	855	1852	NR	985	1591	NR
470	53556	NR	600	39138	NR	730	2611	NR	860	1463	NR	990	2611	NR
475	60829	NR	605	38865	NR	735	2376	NR	865	1656	NR	995	3556	NR
480	56377	NR	610	41532	NR	740	2107	NR	870	1883	NR	1000	3556	NR
485	46320	NR	615	40776	NR	745	2023	NR	875	1818	NR			

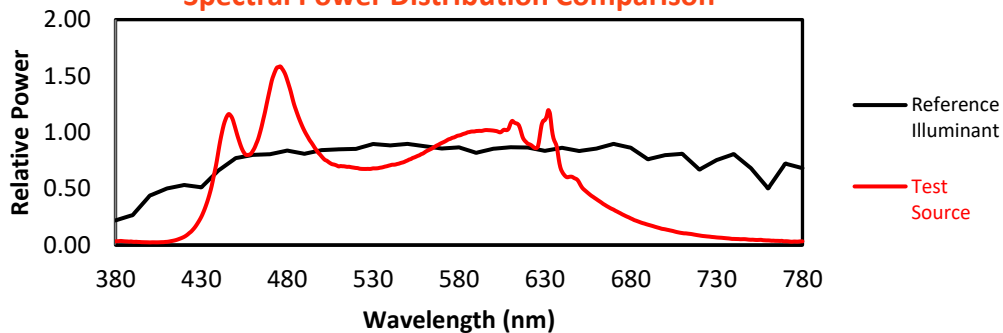
REPORT NUMBER: SP1-2210-795-5

TM-30-18

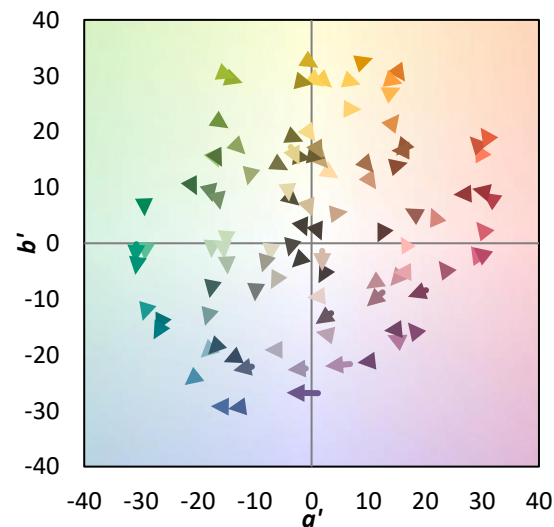
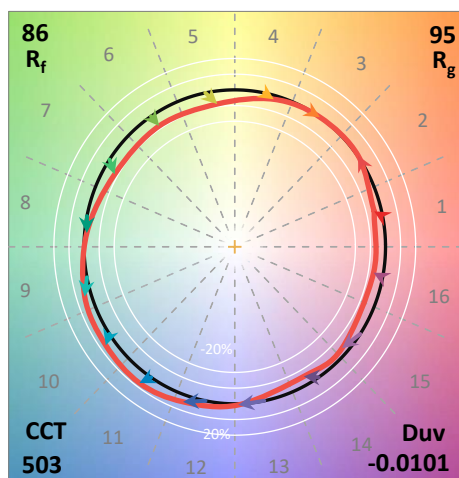
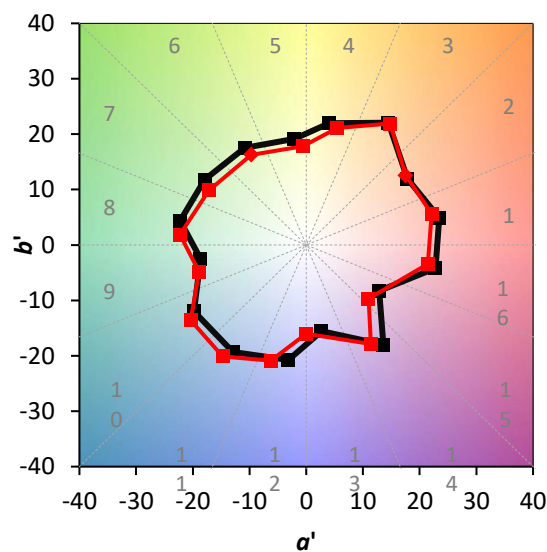
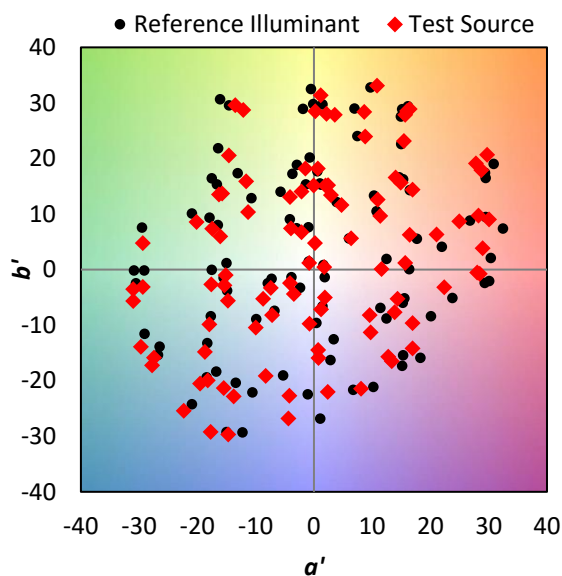
Summary

$R_f = 85.9$
 $R_g = 94.8$
 CIE $R_a = 84.5$
 $R_g = 77.5$

Spectral Power Distribution Comparison



Color Vector Graphics

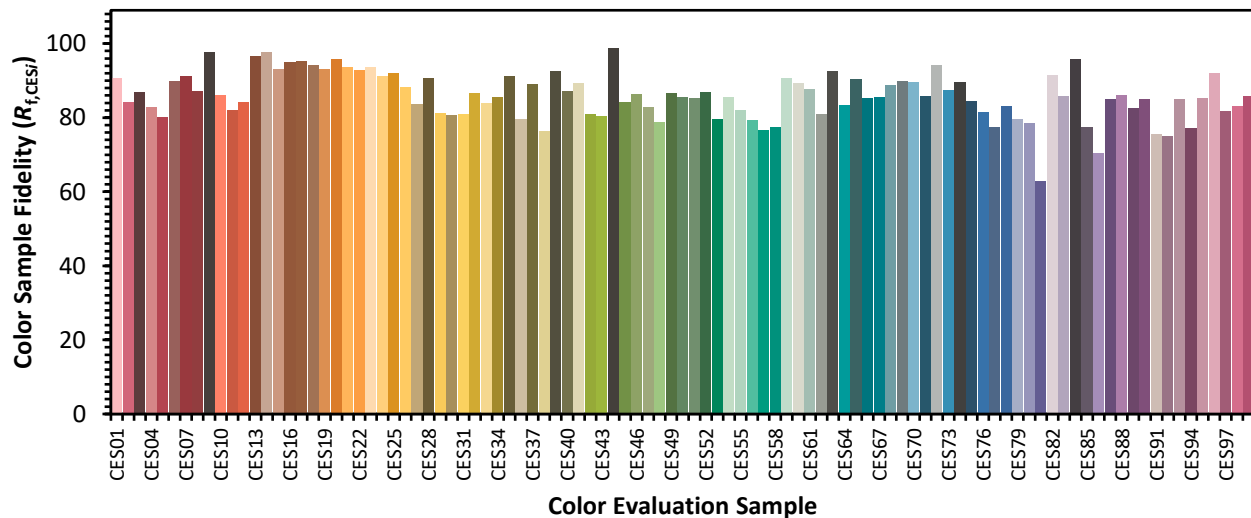


REPORT NUMBER: SP1-2210-795-5

TM-30-18

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

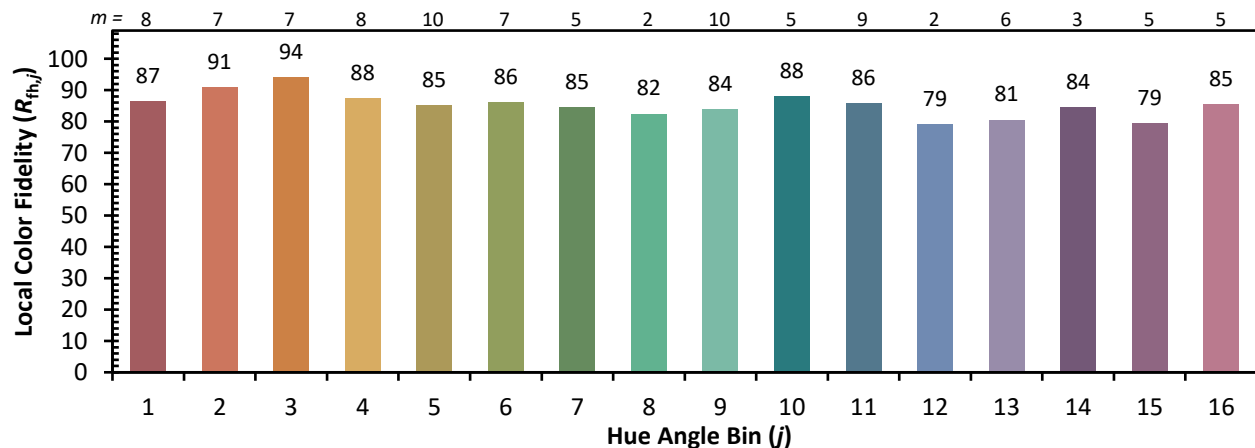
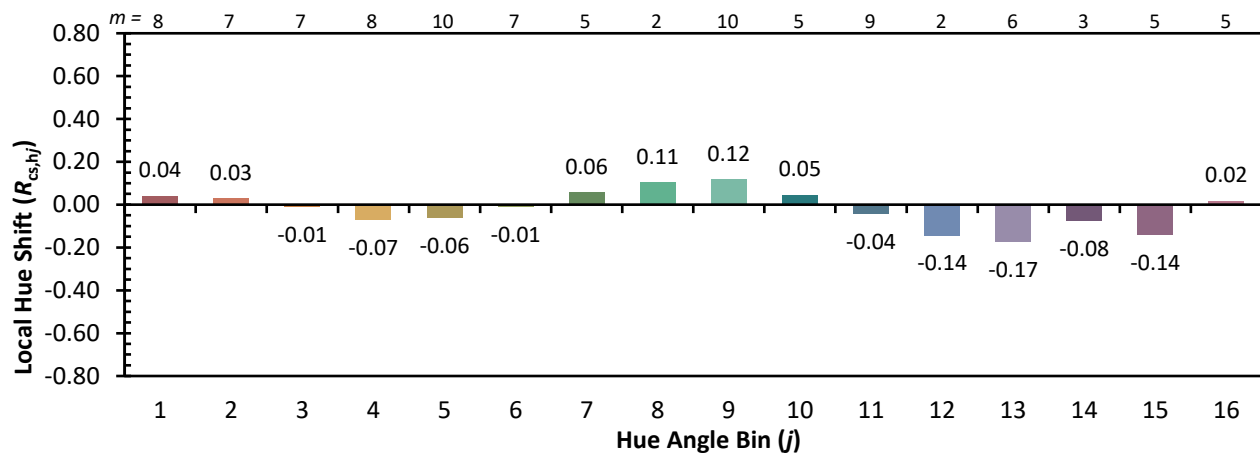
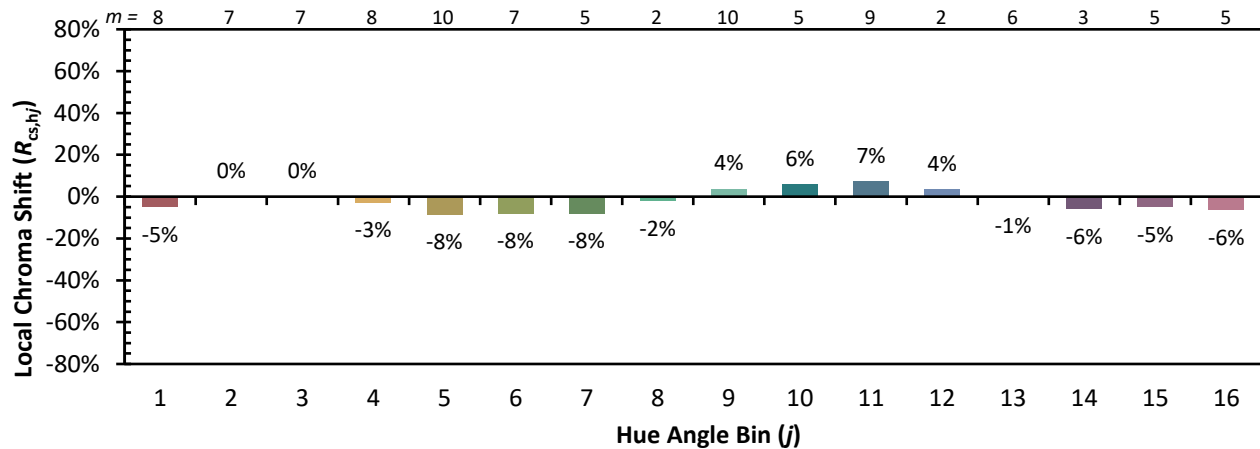
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CES02 = 61	CES27 = 83	CES52 = 87	CES77 = 77
CES03 = 31	CES28 = 90	CES53 = 79	CES78 = 83
CES04 = 69	CES29 = 81	CES54 = 85	CES79 = 80
CES05 = 48	CES30 = 81	CES55 = 82	CES80 = 78
CES06 = 50	CES31 = 81	CES56 = 79	CES81 = 63
CES07 = 41	CES32 = 87	CES57 = 77	CES82 = 92
CES08 = 40	CES33 = 84	CES58 = 77	CES83 = 86
CES09 = 29	CES34 = 85	CES59 = 91	CES84 = 96
CES10 = 74	CES35 = 91	CES60 = 89	CES85 = 77
CES11 = 57	CES36 = 80	CES61 = 87	CES86 = 70
CES12 = 63	CES37 = 89	CES62 = 81	CES87 = 85
CES13 = 43	CES38 = 76	CES63 = 92	CES88 = 86
CES14 = 74	CES39 = 93	CES64 = 83	CES89 = 82
CES15 = 71	CES40 = 87	CES65 = 90	CES90 = 85
CES16 = 47	CES41 = 89	CES66 = 85	CES91 = 76
CES17 = 49	CES42 = 81	CES67 = 86	CES92 = 75
CES18 = 56	CES43 = 80	CES68 = 89	CES93 = 85
CES19 = 71	CES44 = 99	CES69 = 90	CES94 = 77
CES20 = 66	CES45 = 84	CES70 = 89	CES95 = 85
CES21 = 85	CES46 = 86	CES71 = 86	CES96 = 92
CES22 = 77	CES47 = 83	CES72 = 94	CES97 = 82
CES23 = 91	CES48 = 79	CES73 = 87	CES98 = 83
CES24 = 89	CES49 = 87	CES74 = 89	CES99 = 86
CES25 = 70	CES50 = 85	CES75 = 84	



REPORT NUMBER: SP1-2210-795-5

TM-30-18

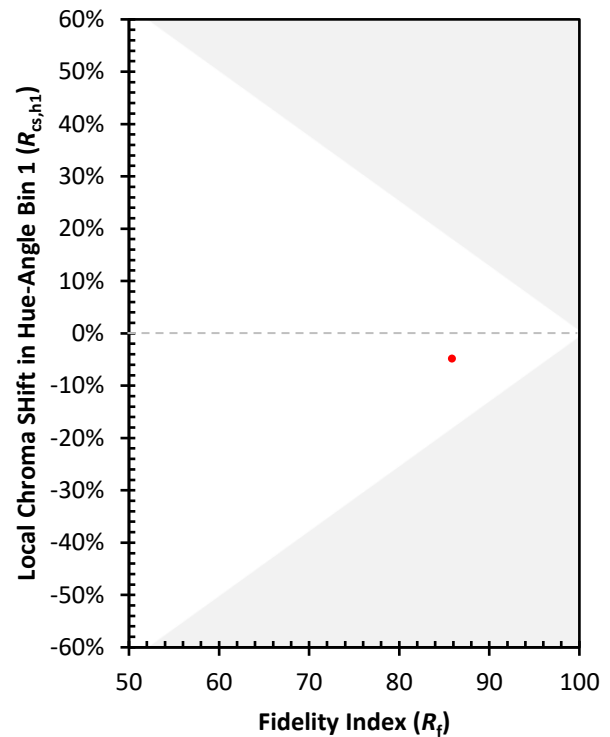
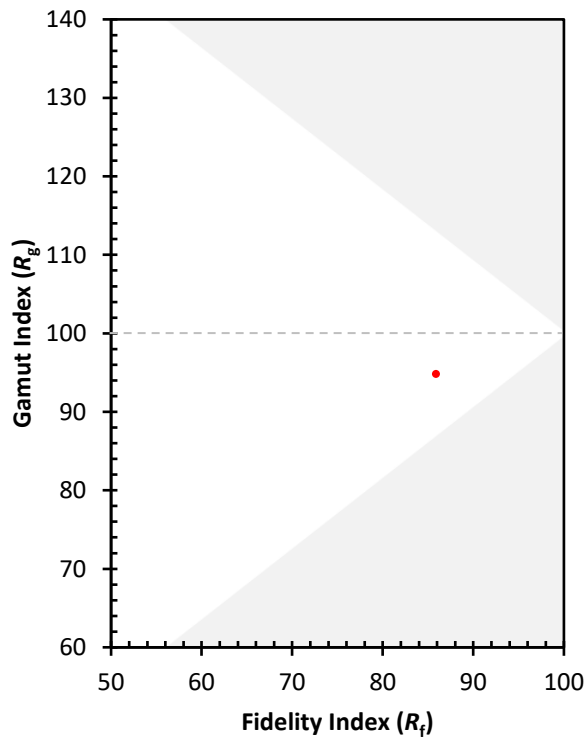
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2210-795-5

TM-30-18

Measure Comparisons



(END OF REPORT)