

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: P735593

Luminaire Tested: **4APN6-24-B2750-W2D-CP250-2700K**

Issue Date: 1/5/2024



Test Information

Test Method: LM-79-08
Report Number: P735593
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: 4APN6-24-B2750-W2D-CP250-2700K
Description: 4FT 2400 AMBIENT LUMEN OUTPUT APN WITH BIO UP LEDS AT 2700K CCT, AND CP250 LENS

Light Source: -
Ballast/Driver: -

Summary

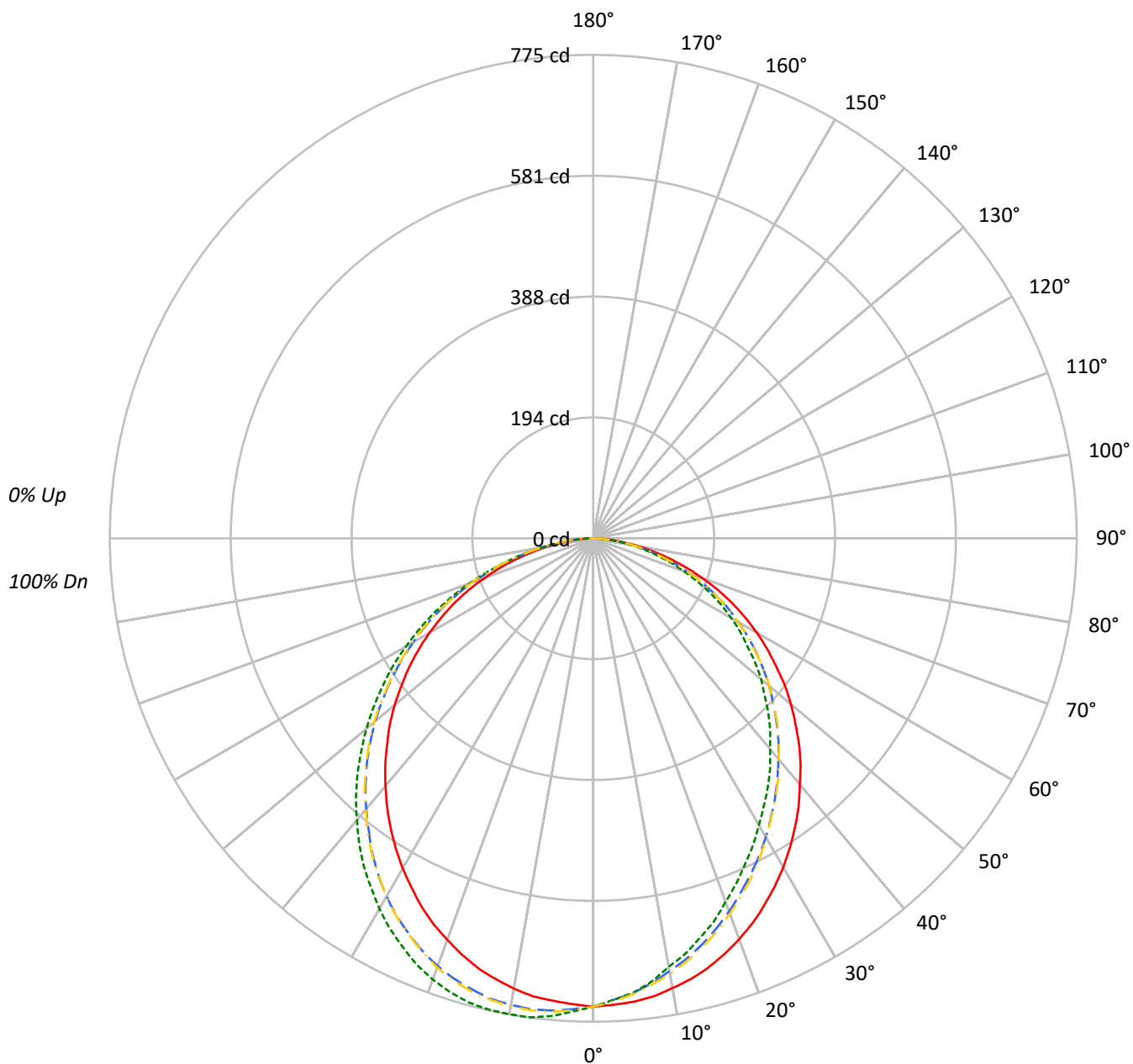
Lumens per Lamp: N/A
Luminaire Lumens: 2014.0 lumens
Efficiency: N/A
Efficacy: 84.6 lumens/watt
Spacing Criteria (0/90/45): 1.21 / 1.21 / 1.33
Luminous Opening: Rectangular (W 0.29' x L: 4' x H: 0')
CIE Type: Direct

Input Watts (W): 23.8
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

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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°	6928	6928	6928	6928
5°	6908	6774	6892	7120
10°	6860	6534	6868	7258
15°	6807	6329	6816	7359
20°	6715	6089	6723	7389
25°	6607	5864	6632	7359
30°	6488	5657	6507	7303
35°	6352	5492	6382	7224
40°	6200	5309	6241	7100
45°	6084	5177	6096	6971
50°	5938	5035	5962	6815
55°	5752	4851	5792	6627
60°	5580	4704	5597	6396
65°	5360	4506	5360	6119
70°	4996	4170	4974	5705
75°	4541	3786	4481	5119
80°	3926	3252	3794	4378
85°	3059	2435	2879	3599



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	71.0	3.5
10°-20°	201.4	10.0
20°-30°	299.4	14.9
30°-40°	352.9	17.5
40°-50°	359.3	17.8
50°-60°	320.1	15.9
60°-70°	241.1	12.0
70°-80°	134.1	6.7
80°-90°	34.9	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°	571.7	28.4
0°-40°	924.6	45.9
0°-60°	1603.9	79.6
0°-90°	2014.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2014.0	100.0

CANDELA DISTRIBUTION:

	0°	90°	180°	270°	360°	Flux
0°	751	751	751	751	751	
5°	746	731	744	769	746	71
15°	713	663	714	770	713	201
25°	649	576	652	723	649	299
35°	564	488	567	641	564	353
45°	466	397	467	534	466	359
55°	358	302	360	412	358	320
65°	246	206	246	280	246	242
75°	127	106	126	144	127	135
85°	29	23	27	34	29	35
90°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
0°	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9
2.5°	748.4	748.4	749.2	745.9	741.6	739.9	739.1	738.2	739.9	740.7	739.9
5°	745.9	744.2	742.4	738.2	733.1	729.7	728.0	727.2	728.9	731.4	728.9
7.5°	740.7	737.4	733.9	728.0	722.1	716.9	714.4	712.7	714.4	716.9	715.2
10°	732.2	728.0	722.9	716.1	707.6	701.7	699.1	696.6	697.4	697.4	697.4
12.5°	723.7	717.9	711.9	703.4	694.0	687.2	683.0	679.6	681.2	682.2	682.2
15°	712.7	705.1	696.6	687.2	677.9	670.2	665.2	661.7	662.6	662.6	663.4
17.5°	699.1	690.7	682.2	671.1	660.0	651.5	645.6	641.4	643.0	643.9	644.7
20°	683.9	674.5	665.2	653.2	641.4	632.0	626.0	621.0	620.2	620.2	621.0
22.5°	667.7	657.5	646.5	633.7	621.0	610.8	604.8	599.7	598.9	598.9	599.7
25°	649.0	638.0	626.9	614.2	600.5	590.4	582.7	577.7	576.8	576.0	577.7
27.5°	629.5	618.4	607.4	594.7	580.2	570.0	562.3	557.3	555.5	554.7	556.4
30°	609.0	596.3	584.5	570.8	558.1	548.0	540.3	534.3	532.7	531.0	532.7
32.5°	587.0	574.2	561.5	548.0	535.2	525.0	517.3	511.4	509.7	508.8	510.5
35°	564.0	551.3	539.5	525.8	513.1	502.9	495.3	490.2	488.5	487.6	488.5
37.5°	541.1	528.4	516.5	502.9	490.2	480.0	472.3	467.2	466.3	465.5	466.3
40°	514.8	503.8	491.8	479.1	466.3	456.2	450.3	444.3	442.6	440.8	443.5
42.5°	491.8	480.8	469.0	457.0	444.3	434.1	427.3	422.2	420.5	419.6	420.5
45°	466.3	454.5	442.6	431.5	419.6	410.3	403.5	398.4	397.6	396.8	397.6
47.5°	439.2	429.0	418.8	407.8	395.8	386.5	380.6	375.5	373.8	372.1	373.8
50°	413.7	403.5	393.3	383.1	372.1	363.6	357.6	352.6	351.6	350.8	351.6
52.5°	386.5	376.3	367.0	356.8	347.4	338.9	333.0	328.8	327.9	327.1	327.9
55°	357.6	349.1	340.6	332.1	322.8	315.1	310.1	304.9	303.3	301.6	303.3
57.5°	330.4	322.8	314.3	305.8	297.3	290.6	285.4	281.2	280.3	279.4	280.3
60°	302.4	295.6	287.9	280.3	271.9	265.1	260.8	257.4	255.7	254.9	255.7
62.5°	274.4	267.6	261.6	254.0	246.4	241.2	237.0	233.6	231.9	231.1	231.9
65°	245.5	239.6	233.6	226.8	220.9	215.7	211.5	208.1	207.2	206.4	206.4
67.5°	215.7	210.7	205.6	199.6	192.9	187.7	183.5	180.9	180.1	179.2	180.1
70°	185.2	180.9	175.9	170.7	165.7	161.4	158.9	156.4	155.4	154.6	154.6
72.5°	156.4	152.9	148.7	144.4	140.2	135.9	133.4	131.7	130.9	130.0	130.0
75°	127.4	124.0	121.5	118.1	113.9	111.2	108.7	107.0	106.2	106.2	106.2
77.5°	100.2	97.7	95.2	91.7	89.2	86.7	85.0	84.1	83.2	83.2	83.2
80°	73.9	72.2	70.5	68.8	66.2	63.7	62.9	62.0	61.2	61.2	61.2
82.5°	50.2	49.3	47.5	45.9	44.2	43.3	42.5	41.7	41.7	41.7	41.7
85°	28.9	28.0	27.2	26.3	25.5	25.5	24.7	23.8	23.0	23.0	23.0
87.5°	11.9	11.9	11.9	11.0	10.2	10.2	10.2	10.2	10.2	10.2	10.2
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):

	110°	120°	130°	140°	150°	160°	170°	180°	190°	200°	210°
0°	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9
2.5°	738.2	739.9	741.6	744.2	746.7	749.2	748.4	747.6	750.9	755.2	756.1
5°	727.2	728.9	731.4	735.7	739.9	743.3	744.2	744.2	750.9	756.9	758.6
7.5°	713.6	716.1	719.5	723.7	729.7	734.8	737.4	740.7	747.6	755.2	758.6
10°	696.6	700.9	705.9	711.9	717.9	723.7	728.9	733.1	741.6	750.1	755.2
12.5°	681.2	685.5	690.7	697.4	705.1	712.7	717.9	723.7	733.9	744.2	750.1
15°	664.3	668.5	674.5	681.2	689.7	698.2	705.9	713.6	723.7	734.8	741.6
17.5°	645.6	649.9	655.8	664.3	673.7	683.0	691.5	700.0	711.9	723.7	731.4
20°	622.7	628.7	636.2	644.7	655.8	666.9	675.4	684.7	697.4	710.2	718.7
22.5°	600.5	606.5	615.0	625.2	637.2	649.0	659.2	669.4	683.0	695.7	705.1
25°	579.3	586.2	594.7	604.8	615.9	627.7	639.7	651.5	665.2	678.7	688.1
27.5°	558.1	564.0	572.5	582.7	595.5	607.4	619.3	631.2	645.6	660.0	670.2
30°	534.3	541.1	548.8	559.0	572.5	586.2	598.0	610.8	625.2	639.7	649.9
32.5°	512.3	518.2	525.8	536.0	549.6	563.2	576.0	589.5	603.2	617.5	627.7
35°	490.2	496.1	503.8	514.0	527.5	541.1	553.8	566.6	580.2	593.8	604.0
37.5°	468.1	474.0	481.7	491.8	504.6	518.2	530.1	542.8	556.4	570.0	579.3
40°	445.1	451.1	457.0	467.2	480.0	493.5	505.5	518.2	531.8	545.3	554.7
42.5°	422.2	428.1	435.8	446.0	457.8	469.8	481.7	493.5	506.3	519.0	528.4
45°	399.3	404.3	412.0	421.3	433.3	444.3	456.2	467.2	480.0	491.8	501.2
47.5°	375.5	380.6	386.5	395.8	407.8	419.6	431.5	442.6	453.6	465.5	474.0
50°	352.6	357.6	364.4	372.9	384.0	395.0	405.2	415.4	426.5	437.5	445.1
52.5°	328.8	333.8	339.8	348.3	357.6	367.8	377.1	387.3	397.6	407.8	415.4
55°	304.9	308.4	313.4	321.1	331.3	341.5	350.8	360.1	369.5	378.0	385.6
57.5°	281.2	285.4	291.4	298.1	306.6	315.1	323.6	332.1	340.6	349.1	355.9
60°	257.4	260.8	265.1	270.9	279.4	287.1	295.6	303.3	310.9	318.6	324.5
62.5°	232.7	236.2	240.4	246.4	253.1	259.9	267.6	274.4	281.2	287.9	293.9
65°	207.2	210.7	214.9	220.0	225.9	231.9	238.7	245.5	250.6	255.7	261.6
67.5°	180.9	184.4	188.6	192.9	197.9	203.9	209.9	215.7	220.9	225.9	230.2
70°	155.4	158.0	162.2	165.7	169.9	174.2	179.2	184.4	187.7	192.0	197.1
72.5°	130.9	133.4	136.7	140.2	142.7	146.1	151.2	155.4	159.7	164.9	167.4
75°	107.0	108.7	111.2	113.9	116.4	118.9	122.4	125.7	129.1	131.7	135.1
77.5°	83.2	85.0	87.5	89.2	90.9	92.6	95.2	97.7	100.2	101.9	105.4
80°	61.2	62.9	64.5	66.2	68.0	69.7	70.5	71.4	74.7	77.3	79.0
82.5°	41.7	42.5	43.3	45.0	45.9	46.7	47.5	47.5	49.3	51.0	53.5
85°	23.8	24.7	25.5	25.5	25.5	25.5	26.3	27.2	28.0	29.7	31.5
87.5°	9.3	9.3	10.2	10.2	10.2	10.2	10.2	10.2	11.0	12.7	13.6
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°	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9	750.9
2.5°	755.2	756.1	757.7	758.6	759.4	759.4	760.3	761.1	759.4	757.7	756.9
5°	759.4	760.3	762.9	765.4	767.1	768.8	767.9	767.1	765.4	762.9	761.1
7.5°	760.3	762.9	765.4	768.8	771.4	774.7	773.1	771.4	767.9	764.6	762.0
10°	757.7	761.1	765.4	769.6	772.2	774.7	773.1	771.4	767.9	763.7	760.3
12.5°	754.4	758.6	763.7	767.9	770.4	773.9	771.4	768.8	764.6	760.3	756.1
15°	746.7	751.8	757.7	762.9	767.1	770.4	767.9	766.2	761.1	755.2	749.2
17.5°	737.4	744.2	750.1	756.1	759.4	762.9	761.1	759.4	753.5	746.7	739.9
20°	726.4	733.1	739.1	745.0	749.2	752.6	750.1	747.6	741.6	735.7	728.9
22.5°	712.7	719.5	726.4	732.2	736.5	739.9	736.5	732.2	726.4	720.4	713.6
25°	695.7	703.4	711.0	716.9	719.5	722.9	719.5	716.1	710.2	704.2	696.6
27.5°	678.7	686.4	694.0	700.0	702.5	705.9	702.5	699.1	693.2	687.2	679.6
30°	659.2	666.9	674.5	680.4	683.0	685.5	682.2	678.7	673.7	667.7	660.0
32.5°	637.2	644.7	650.7	656.7	660.0	663.4	660.0	657.5	651.5	643.9	636.2
35°	613.3	621.0	628.7	634.5	638.0	641.4	637.2	632.9	627.7	621.8	615.0
37.5°	587.0	595.5	604.0	610.8	613.3	616.7	613.3	609.0	604.0	598.0	590.4
40°	562.3	570.0	577.7	584.5	587.0	589.5	586.2	582.7	576.8	570.8	563.2
42.5°	536.9	544.5	551.3	557.3	559.8	563.2	559.8	555.5	551.3	546.2	539.5
45°	509.7	517.3	523.3	529.2	531.8	534.3	531.0	526.7	522.5	518.2	511.4
47.5°	481.7	488.5	494.5	500.3	502.0	504.6	501.2	498.7	494.5	490.2	484.2
50°	452.8	459.6	465.5	470.6	472.3	474.8	471.5	468.1	464.7	461.3	456.2
52.5°	423.0	429.0	435.0	440.0	441.8	443.5	440.0	436.6	433.3	429.8	424.8
55°	392.5	398.4	404.3	408.6	410.3	412.0	408.6	406.1	402.6	400.1	395.0
57.5°	361.9	367.8	372.9	377.1	378.9	380.6	377.1	373.8	371.3	368.6	364.4
60°	330.4	336.4	340.6	344.1	345.8	346.6	343.2	340.6	338.9	337.3	333.0
62.5°	299.9	304.1	308.4	310.9	312.6	313.4	310.9	309.2	307.6	305.8	302.4
65°	267.6	272.7	276.1	278.6	279.4	280.3	277.8	276.1	274.4	272.7	270.1
67.5°	235.3	239.6	242.1	244.6	245.5	245.5	245.5	244.6	242.9	240.4	237.9
70°	203.0	206.4	208.9	210.7	211.5	211.5	209.9	208.1	208.1	207.2	205.6
72.5°	169.9	172.4	174.2	175.9	175.9	175.9	175.9	176.7	175.9	174.2	171.6
75°	138.5	141.0	142.7	143.6	143.6	143.6	143.6	144.4	143.6	142.7	141.0
77.5°	108.7	110.4	111.2	112.2	112.2	112.2	113.0	113.9	113.0	112.2	111.2
80°	80.7	81.5	82.4	83.2	82.4	82.4	83.2	85.0	84.1	83.2	82.4
82.5°	55.2	56.0	56.9	56.9	57.7	58.7	58.7	58.7	58.7	57.7	56.9
85°	33.2	34.0	34.0	34.0	34.0	34.0	34.8	35.7	35.7	34.8	34.8
87.5°	15.3	16.2	15.3	14.5	13.6	13.6	15.3	17.0	17.0	16.2	16.2
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: P735593

CATALOG NUMBER: 4APN6-24-B2750-W2D-CP250-2700K

CANDELA DISTRIBUTION (continued):

	330°	340°	350°	360°
0°	750.9	750.9	750.9	750.9
2.5°	757.7	756.9	752.6	748.4
5°	760.3	757.7	751.8	745.9
7.5°	760.3	756.9	748.4	740.7
10°	756.1	750.9	741.6	732.2
12.5°	750.9	745.0	733.9	723.7
15°	743.3	736.5	724.6	712.7
17.5°	732.2	723.7	711.9	699.1
20°	721.2	711.9	697.4	683.9
22.5°	705.9	697.4	682.2	667.7
25°	688.9	679.6	664.3	649.0
27.5°	671.1	660.0	644.7	629.5
30°	650.7	639.7	624.4	609.0
32.5°	628.7	618.4	603.2	587.0
35°	606.5	595.5	580.2	564.0
37.5°	581.9	571.7	556.4	541.1
40°	555.5	545.3	530.1	514.8
42.5°	531.0	521.6	506.3	491.8
45°	503.8	494.5	480.0	466.3
47.5°	475.7	466.3	452.8	439.2
50°	448.5	439.2	426.5	413.7
52.5°	418.0	410.3	398.4	386.5
55°	388.3	380.6	368.6	357.6
57.5°	358.5	351.6	340.6	330.4
60°	327.1	320.3	311.8	302.4
62.5°	297.3	291.4	282.9	274.4
65°	265.9	260.8	253.1	245.5
67.5°	233.6	229.4	222.6	215.7
70°	201.4	196.2	191.1	185.2
72.5°	169.1	166.5	161.4	156.4
75°	138.5	135.9	131.7	127.4
77.5°	109.6	107.0	103.7	100.2
80°	80.7	79.0	76.5	73.9
82.5°	56.0	54.4	52.7	50.2
85°	34.0	32.3	30.5	28.9
87.5°	15.3	14.5	12.7	11.9
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: SP1-2210-795-1

Test Date: 10/06/2022

Luminaire Tested: 9WP217084MDER4AM-2700K-315MA

Data in this report applies to families of products including 9WP217084MDER4AM-2700K.

Test Information

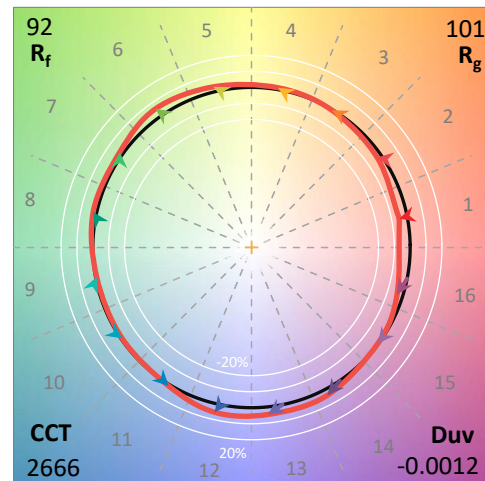
Test Method: LM-79-2019
 Report Number: SP1-2210-795-1
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/06/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: METALUX
 Catalog Number: **9WP217084MDER4AM-2700K-315MA**
 Description: METALUX

TUNABLE BOARD, 2700K-315MA, PROGRAMMED @0Vdc

Spectral Parameters

CCT (K):	2666	CRI (Ra):	94.1		
CIE u':	0.2643	R1:	96.2	R9:	58.8
CIE v':	0.5262	R2:	97.9	R10:	93.6
Duv:	-0.0012	R3:	98.1	R11:	96.6
CIE x:	0.4604	R4:	96.1	R12:	90.2
CIE y:	0.4075	R5:	96.2	R13:	96.8
CIE z:	0.1321	R6:	96.5	R14:	97.5
Peak Wavelength (nm):	632	R7:	90.7		
Dominant Wavelength (nm):	584	R8:	81.4		
Purity:	61				

Rf: 91.5
 Rg: 101.3



Test Conditions

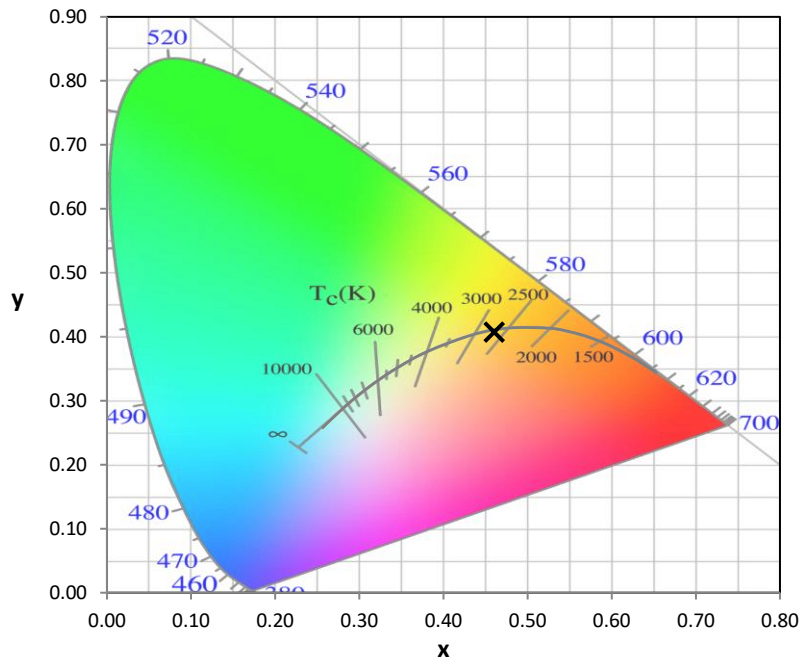
Stabilization Time: 146M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 24.0/38%
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2210-795-1

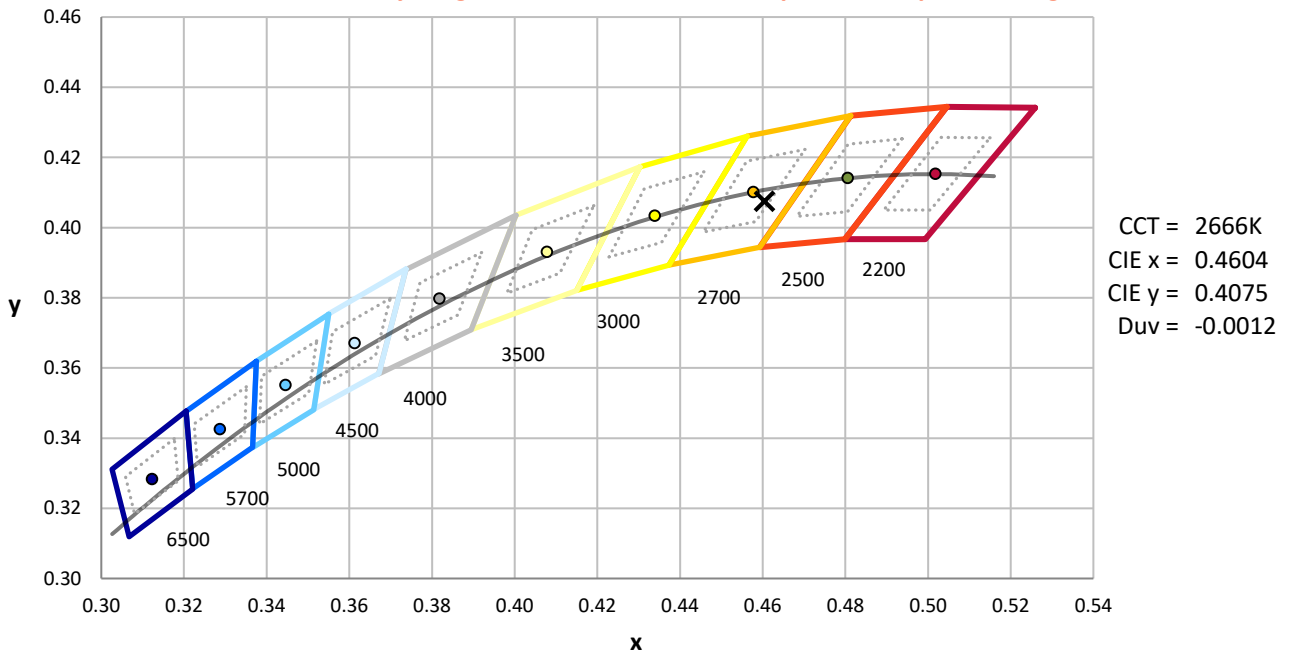
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	8/8/2022	2/8/2023
Power Meter	XITRON 2801 IN0071	11/29/2021	11/29/2022
AC Power Source	CHROMA 61603 IN0063	11/29/2021	11/29/2022
DC Power Source	AGILENT E3634A IN0208	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: SP1-2210-795-1

CIE 1931 Chromaticity Diagram



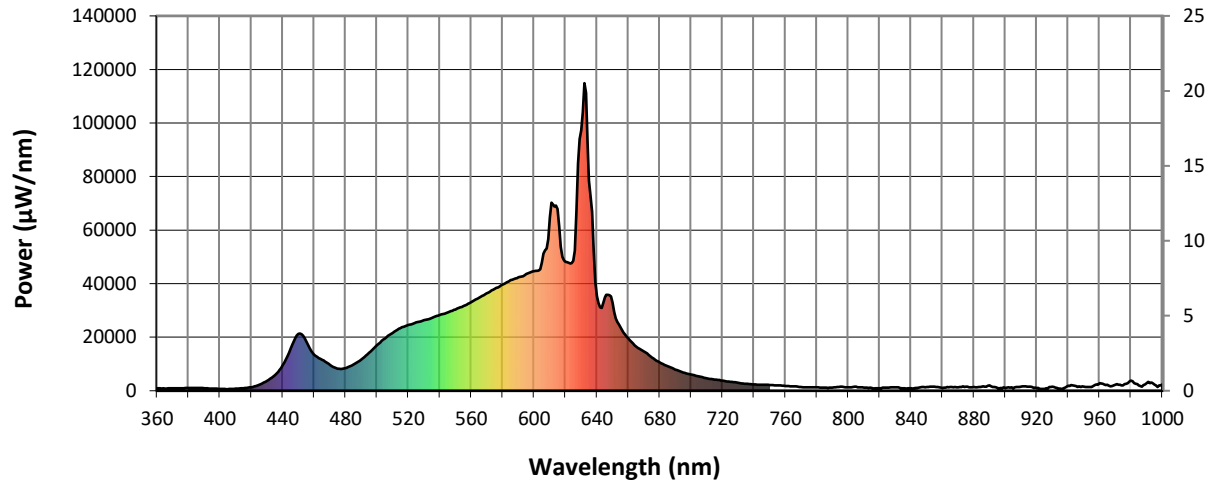
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2210-795-1

Photopic Flux vs. Wavelength

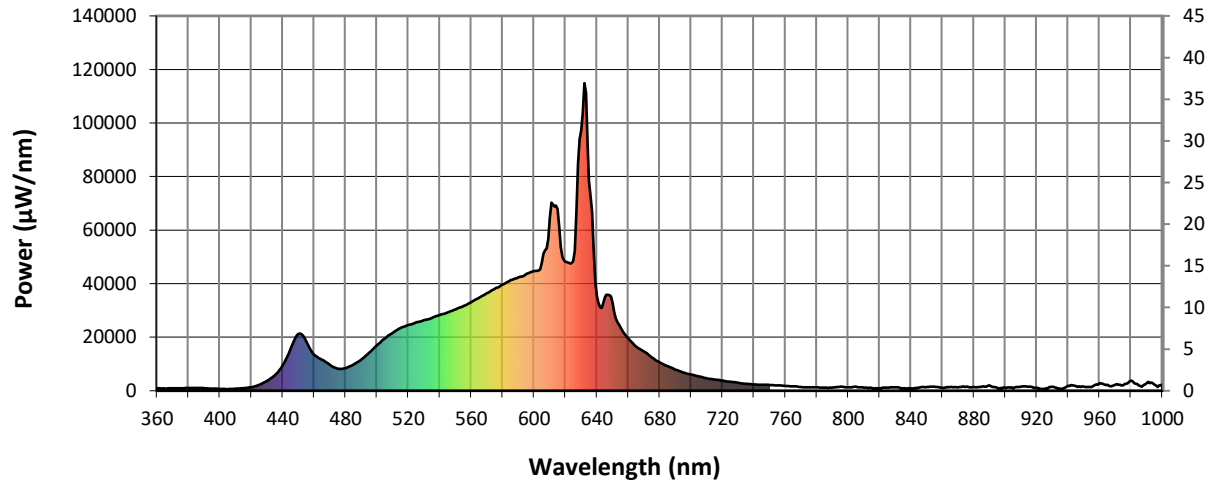


#####

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	960	NR	490	11655	NR	620	48137	NR	750	2159	NR	880	1428	NR
365	835	NR	495	14187	NR	625	48484	NR	755	2025	NR	885	1524	NR
370	889	NR	500	17034	NR	630	97268	NR	760	1802	NR	890	1952	NR
375	919	NR	505	19485	NR	635	78475	NR	765	1584	NR	895	1011	NR
380	1009	NR	510	21619	NR	640	35314	NR	770	1353	NR	900	1014	NR
385	1040	NR	515	23444	NR	645	34925	NR	775	1274	NR	905	955	NR
390	939	NR	520	24555	NR	650	32851	NR	780	1257	NR	910	1509	NR
395	813	NR	525	25491	NR	655	23599	NR	785	1107	NR	915	1506	NR
400	710	NR	530	26360	NR	660	19532	NR	790	1143	NR	920	1068	NR
405	620	NR	535	27190	NR	665	16486	NR	795	1531	NR	925	638	NR
410	774	NR	540	28277	NR	670	14655	NR	800	1331	NR	930	1536	NR
415	979	NR	545	29229	NR	675	12412	NR	805	1467	NR	935	842	NR
420	1333	NR	550	30350	NR	680	10584	NR	810	1194	NR	940	1826	NR
425	2180	NR	555	31650	NR	685	9145	NR	815	1068	NR	945	1708	NR
430	3664	NR	560	33070	NR	690	7913	NR	820	903	NR	950	1541	NR
435	5835	NR	565	34723	NR	695	6836	NR	825	1155	NR	955	1365	NR
440	9472	NR	570	36375	NR	700	6062	NR	830	1254	NR	960	2795	NR
445	15693	NR	575	38067	NR	705	5352	NR	835	969	NR	965	2273	NR
450	21182	NR	580	39619	NR	710	4621	NR	840	885	NR	970	2269	NR
455	18329	NR	585	41308	NR	715	4197	NR	845	1169	NR	975	2026	NR
460	13472	NR	590	42407	NR	720	3736	NR	850	1432	NR	980	3840	NR
465	11611	NR	595	43552	NR	725	3370	NR	855	1474	NR	985	2004	NR
470	9668	NR	600	44708	NR	730	2929	NR	860	1037	NR	990	2889	NR
475	8254	NR	605	47912	NR	735	2599	NR	865	1441	NR	995	2268	NR
480	8432	NR	610	64799	NR	740	2366	NR	870	1316	NR	1000	2322	NR
485	9747	NR	615	67855	NR	745	2257	NR	875	1515	NR			

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Scotopic Flux vs. Wavelength



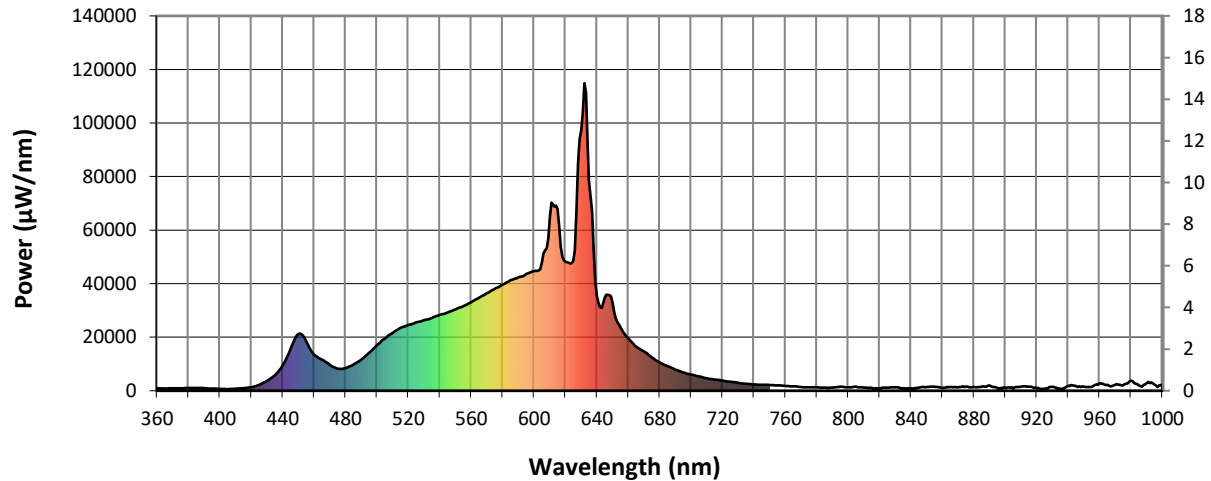
Scotopic Lumens: 3229.5

S/P: 1.28

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	960	NR	490	11655	NR	620	48137	NR	750	2159	NR	880	1428	NR
365	835	NR	495	14187	NR	625	48484	NR	755	2025	NR	885	1524	NR
370	889	NR	500	17034	NR	630	97268	NR	760	1802	NR	890	1952	NR
375	919	NR	505	19485	NR	635	78475	NR	765	1584	NR	895	1011	NR
380	1009	NR	510	21619	NR	640	35314	NR	770	1353	NR	900	1014	NR
385	1040	NR	515	23444	NR	645	34925	NR	775	1274	NR	905	955	NR
390	939	NR	520	24555	NR	650	32851	NR	780	1257	NR	910	1509	NR
395	813	NR	525	25491	NR	655	23599	NR	785	1107	NR	915	1506	NR
400	710	NR	530	26360	NR	660	19532	NR	790	1143	NR	920	1068	NR
405	620	NR	535	27190	NR	665	16486	NR	795	1531	NR	925	638	NR
410	774	NR	540	28277	NR	670	14655	NR	800	1331	NR	930	1536	NR
415	979	NR	545	29229	NR	675	12412	NR	805	1467	NR	935	842	NR
420	1333	NR	550	30350	NR	680	10584	NR	810	1194	NR	940	1826	NR
425	2180	NR	555	31650	NR	685	9145	NR	815	1068	NR	945	1708	NR
430	3664	NR	560	33070	NR	690	7913	NR	820	903	NR	950	1541	NR
435	5835	NR	565	34723	NR	695	6836	NR	825	1155	NR	955	1365	NR
440	9472	NR	570	36375	NR	700	6062	NR	830	1254	NR	960	2795	NR
445	15693	NR	575	38067	NR	705	5352	NR	835	969	NR	965	2273	NR
450	21182	NR	580	39619	NR	710	4621	NR	840	885	NR	970	2269	NR
455	18329	NR	585	41308	NR	715	4197	NR	845	1169	NR	975	2026	NR
460	13472	NR	590	42407	NR	720	3736	NR	850	1432	NR	980	3840	NR
465	11611	NR	595	43552	NR	725	3370	NR	855	1474	NR	985	2004	NR
470	9668	NR	600	44708	NR	730	2929	NR	860	1037	NR	990	2889	NR
475	8254	NR	605	47912	NR	735	2599	NR	865	1441	NR	995	2268	NR
480	8432	NR	610	64799	NR	740	2366	NR	870	1316	NR	1000	2322	NR
485	9747	NR	615	67855	NR	745	2257	NR	875	1515	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 1204.8

S/P: 0.48

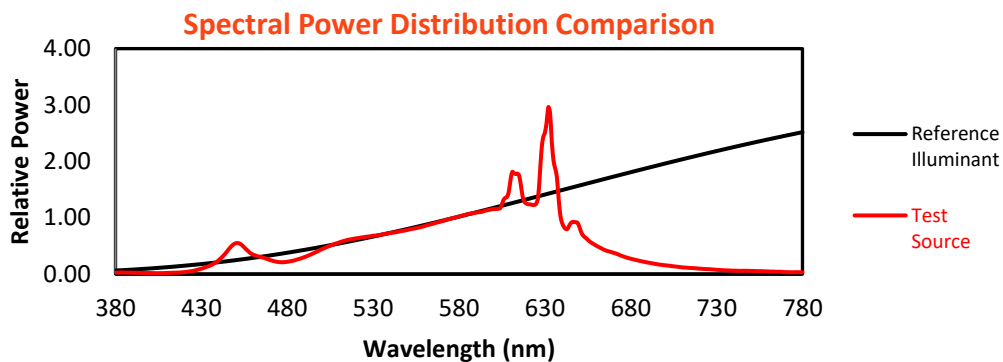
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360	960	NR	490	11655	NR	620	48137	NR	750	2159	NR	880	1428	NR
365	835	NR	495	14187	NR	625	48484	NR	755	2025	NR	885	1524	NR
370	889	NR	500	17034	NR	630	97268	NR	760	1802	NR	890	1952	NR
375	919	NR	505	19485	NR	635	78475	NR	765	1584	NR	895	1011	NR
380	1009	NR	510	21619	NR	640	35314	NR	770	1353	NR	900	1014	NR
385	1040	NR	515	23444	NR	645	34925	NR	775	1274	NR	905	955	NR
390	939	NR	520	24555	NR	650	32851	NR	780	1257	NR	910	1509	NR
395	813	NR	525	25491	NR	655	23599	NR	785	1107	NR	915	1506	NR
400	710	NR	530	26360	NR	660	19532	NR	790	1143	NR	920	1068	NR
405	620	NR	535	27190	NR	665	16486	NR	795	1531	NR	925	638	NR
410	774	NR	540	28277	NR	670	14655	NR	800	1331	NR	930	1536	NR
415	979	NR	545	29229	NR	675	12412	NR	805	1467	NR	935	842	NR
420	1333	NR	550	30350	NR	680	10584	NR	810	1194	NR	940	1826	NR
425	2180	NR	555	31650	NR	685	9145	NR	815	1068	NR	945	1708	NR
430	3664	NR	560	33070	NR	690	7913	NR	820	903	NR	950	1541	NR
435	5835	NR	565	34723	NR	695	6836	NR	825	1155	NR	955	1365	NR
440	9472	NR	570	36375	NR	700	6062	NR	830	1254	NR	960	2795	NR
445	15693	NR	575	38067	NR	705	5352	NR	835	969	NR	965	2273	NR
450	21182	NR	580	39619	NR	710	4621	NR	840	885	NR	970	2269	NR
455	18329	NR	585	41308	NR	715	4197	NR	845	1169	NR	975	2026	NR
460	13472	NR	590	42407	NR	720	3736	NR	850	1432	NR	980	3840	NR
465	11611	NR	595	43552	NR	725	3370	NR	855	1474	NR	985	2004	NR
470	9668	NR	600	44708	NR	730	2929	NR	860	1037	NR	990	2889	NR
475	8254	NR	605	47912	NR	735	2599	NR	865	1441	NR	995	2268	NR
480	8432	NR	610	64799	NR	740	2366	NR	870	1316	NR	1000	2322	NR
485	9747	NR	615	67855	NR	745	2257	NR	875	1515	NR			

REPORT NUMBER: SP1-2210-795-1

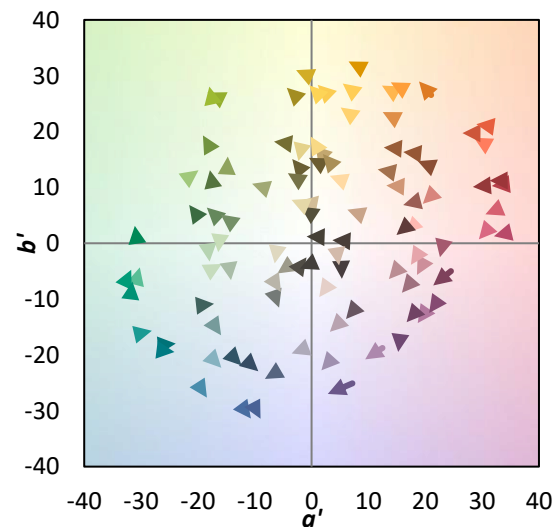
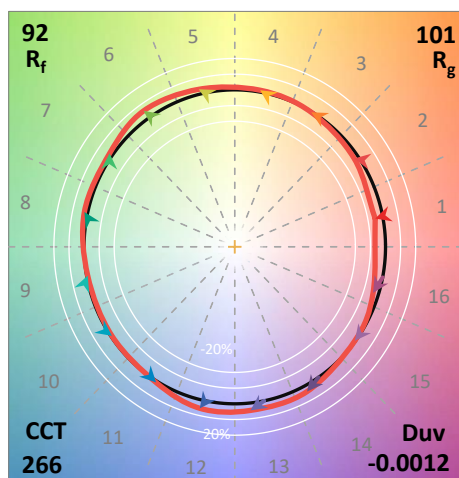
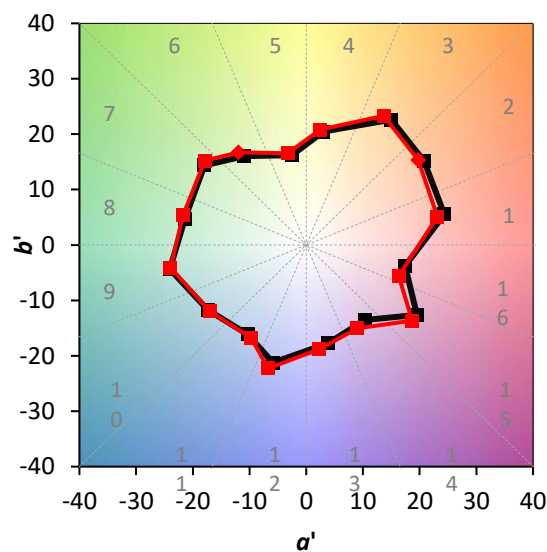
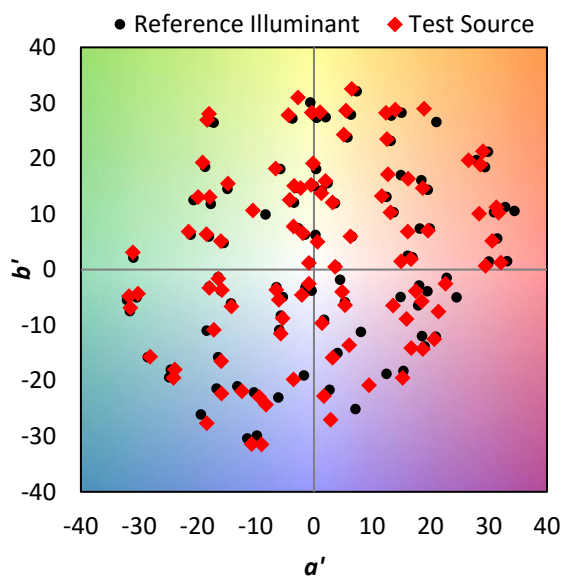
TM-30-18

Summary

$R_f = 91.5$
 $R_g = 101.3$
 CIE $R_a = 94.1$
 $R_g = 58.8$



Color Vector Graphics

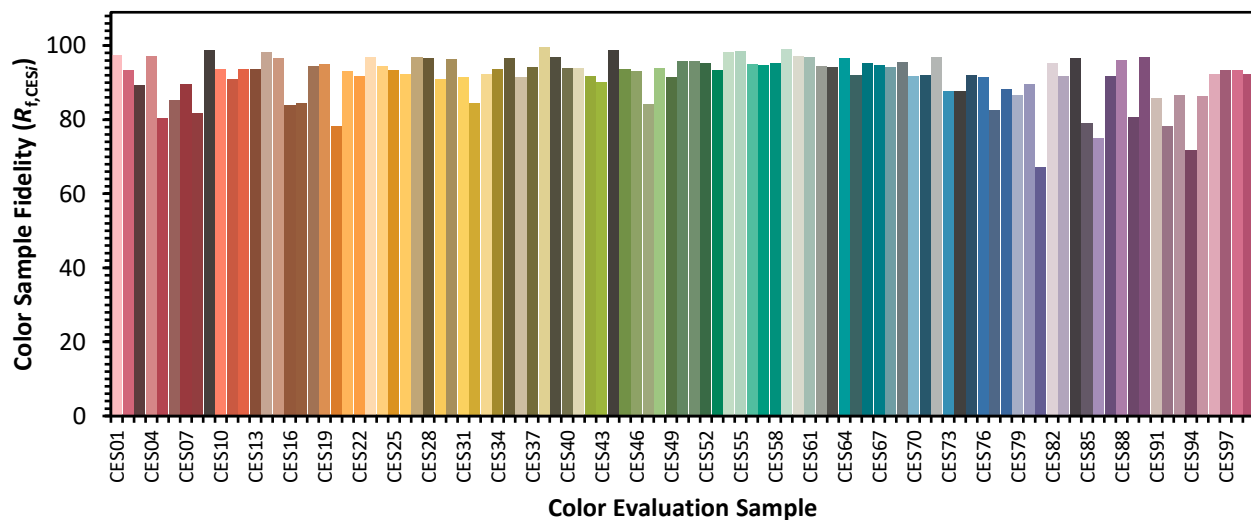


REPORT NUMBER: SP1-2210-795-1

TM-30-18

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

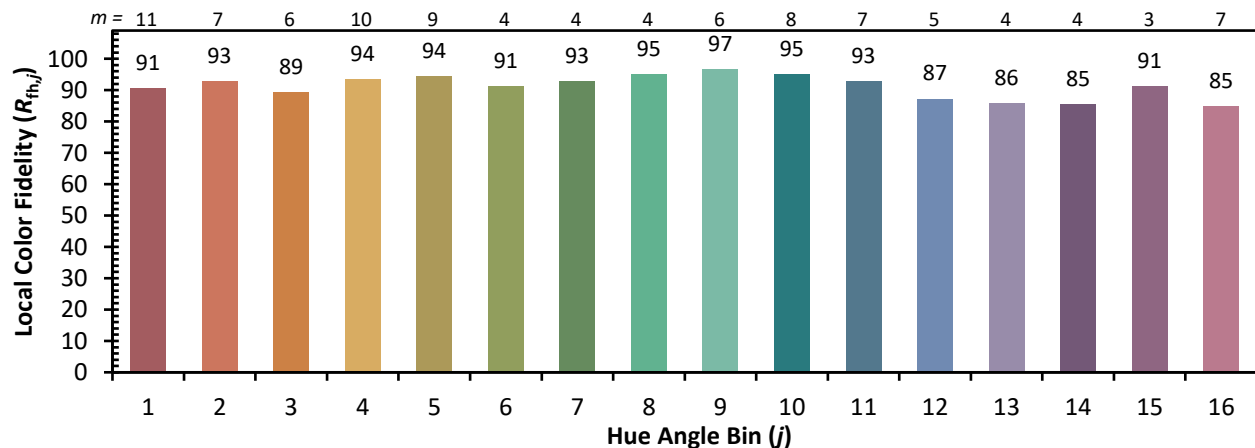
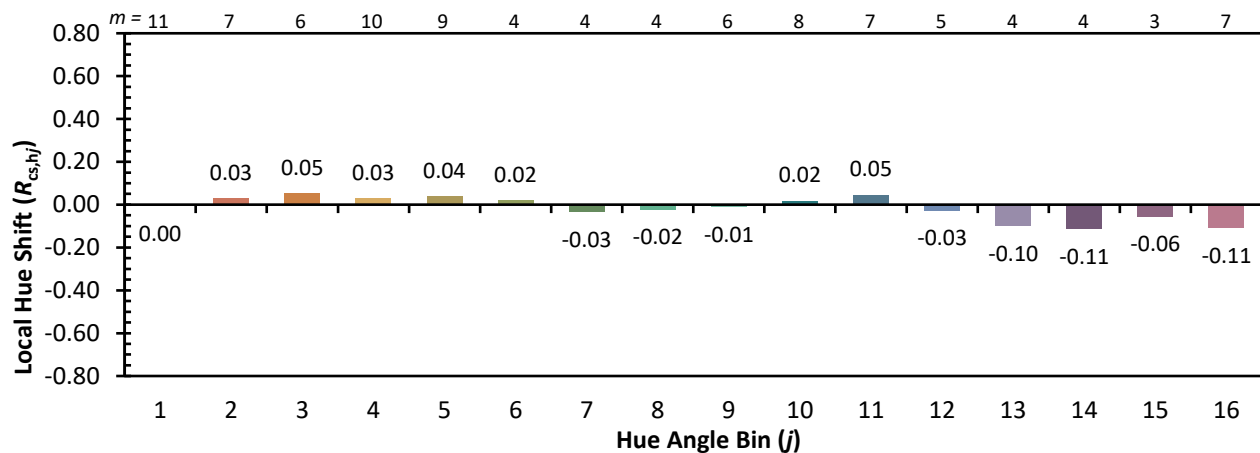
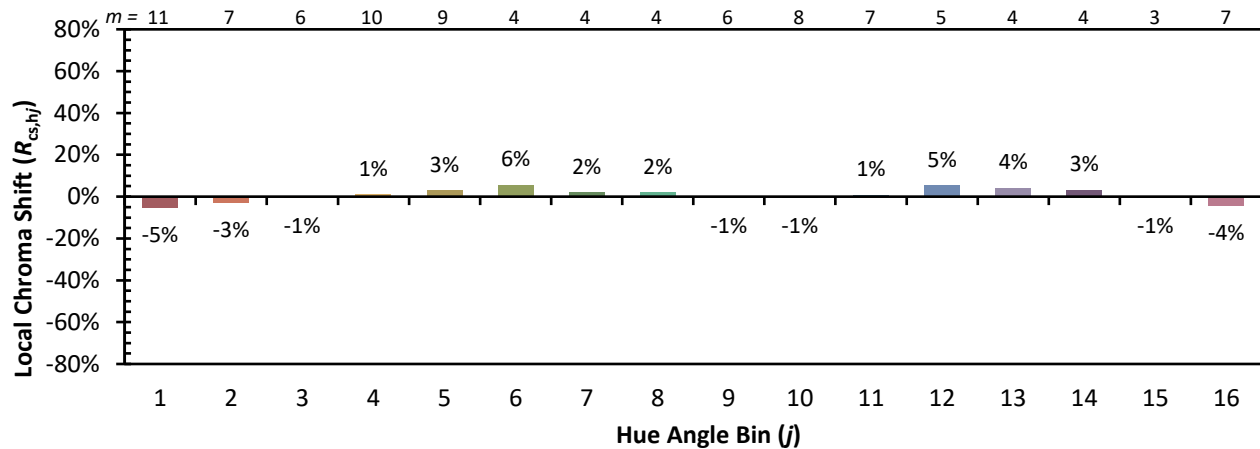
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CES02 = 64	CES27 = 97	CES52 = 95	CES77 = 83
CES03 = 32	CES28 = 97	CES53 = 93	CES78 = 88
CES04 = 71	CES29 = 91	CES54 = 98	CES79 = 87
CES05 = 51	CES30 = 96	CES55 = 99	CES80 = 90
CES06 = 51	CES31 = 91	CES56 = 95	CES81 = 67
CES07 = 44	CES32 = 84	CES57 = 95	CES82 = 95
CES08 = 43	CES33 = 92	CES58 = 95	CES83 = 92
CES09 = 29	CES34 = 94	CES59 = 99	CES84 = 96
CES10 = 77	CES35 = 97	CES60 = 97	CES85 = 79
CES11 = 59	CES36 = 91	CES61 = 97	CES86 = 75
CES12 = 66	CES37 = 94	CES62 = 94	CES87 = 92
CES13 = 45	CES38 = 99	CES63 = 94	CES88 = 96
CES14 = 74	CES39 = 97	CES64 = 97	CES89 = 81
CES15 = 72	CES40 = 94	CES65 = 92	CES90 = 97
CES16 = 48	CES41 = 94	CES66 = 95	CES91 = 86
CES17 = 50	CES42 = 92	CES67 = 95	CES92 = 78
CES18 = 57	CES43 = 90	CES68 = 94	CES93 = 87
CES19 = 72	CES44 = 99	CES69 = 95	CES94 = 72
CES20 = 68	CES45 = 94	CES70 = 92	CES95 = 86
CES21 = 87	CES46 = 93	CES71 = 92	CES96 = 92
CES22 = 79	CES47 = 84	CES72 = 97	CES97 = 93
CES23 = 92	CES48 = 94	CES73 = 88	CES98 = 93
CES24 = 91	CES49 = 91	CES74 = 88	CES99 = 92
CES25 = 72	CES50 = 96	CES75 = 92	



REPORT NUMBER: SP1-2210-795-1

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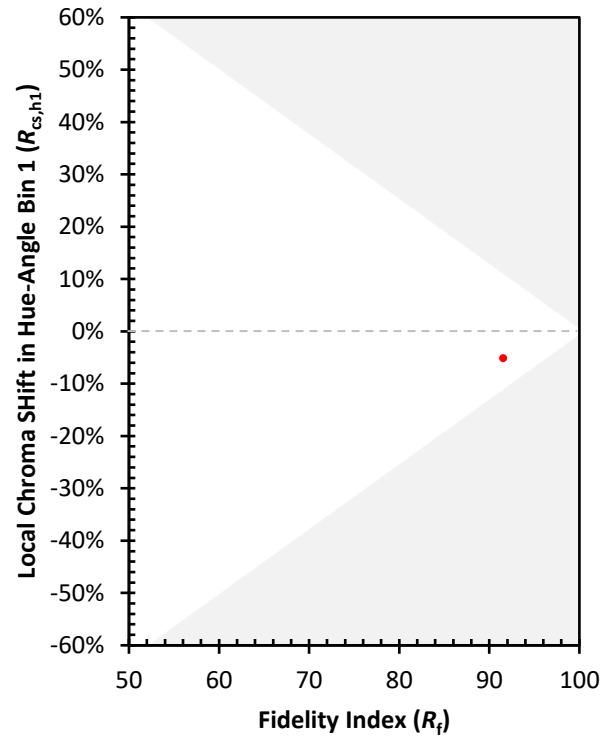
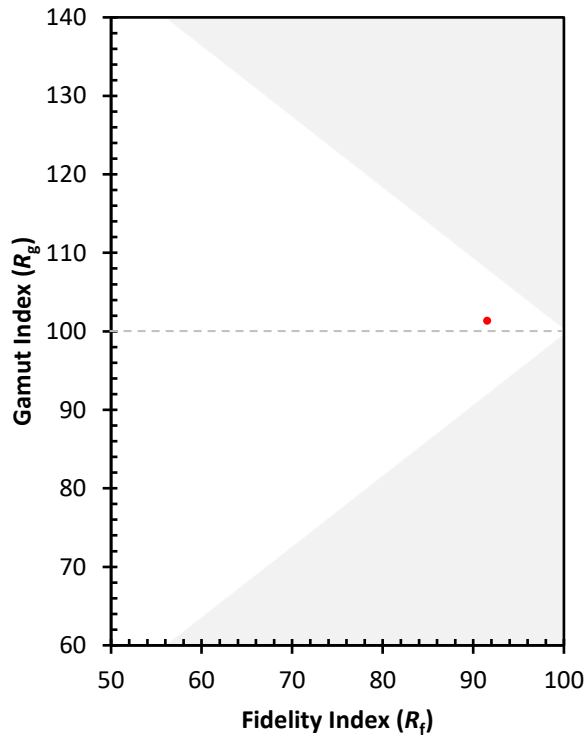
Color Rendition by Hue-Angle Bin



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TM-30-18

Measure Comparisons



(END OF REPORT)