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: McGRAW-EDISON

Report Number: P832959

Luminaire Tested: **TTN-D0-830-U-DL-UPL3**

Issue Date: 5/15/2024

Report Generated By 670246001

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:	P832959
	REPORT IS FROM IESNA LM-79-08 TEST DATA - UPLIGHT (G3-2308-121-4) AND
Test Lab:	INNOVATION CENTER
Issue Date:	5/15/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line:	McGRAW-EDISON
Catalog Number:	TTN-D0-830-U-DL-UPL3
Description:	TOPTIER NANO LED PARKING GARAGE LUMINAIRE WITH UPLIGHT
	3000K, 80 CRI LEDS AND DRIVE LANE DISTRIBUTION
Light Source:	-
Ballast/Driver:	-

Summary

Lumens per Lamp:	N/A
Luminaire Lumens:	1773.7 lumens
Efficiency:	N/A
Efficacy:	100.2 lumens/watt
Luminous Opening:	Vertical Cylinder (Dia: 0.71' x H: 0.1')
IES Classification:	Type IV - Short
BUG Rating:	B0 - U4 - G1

Input Watts (W):	17.7
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:	24 FT

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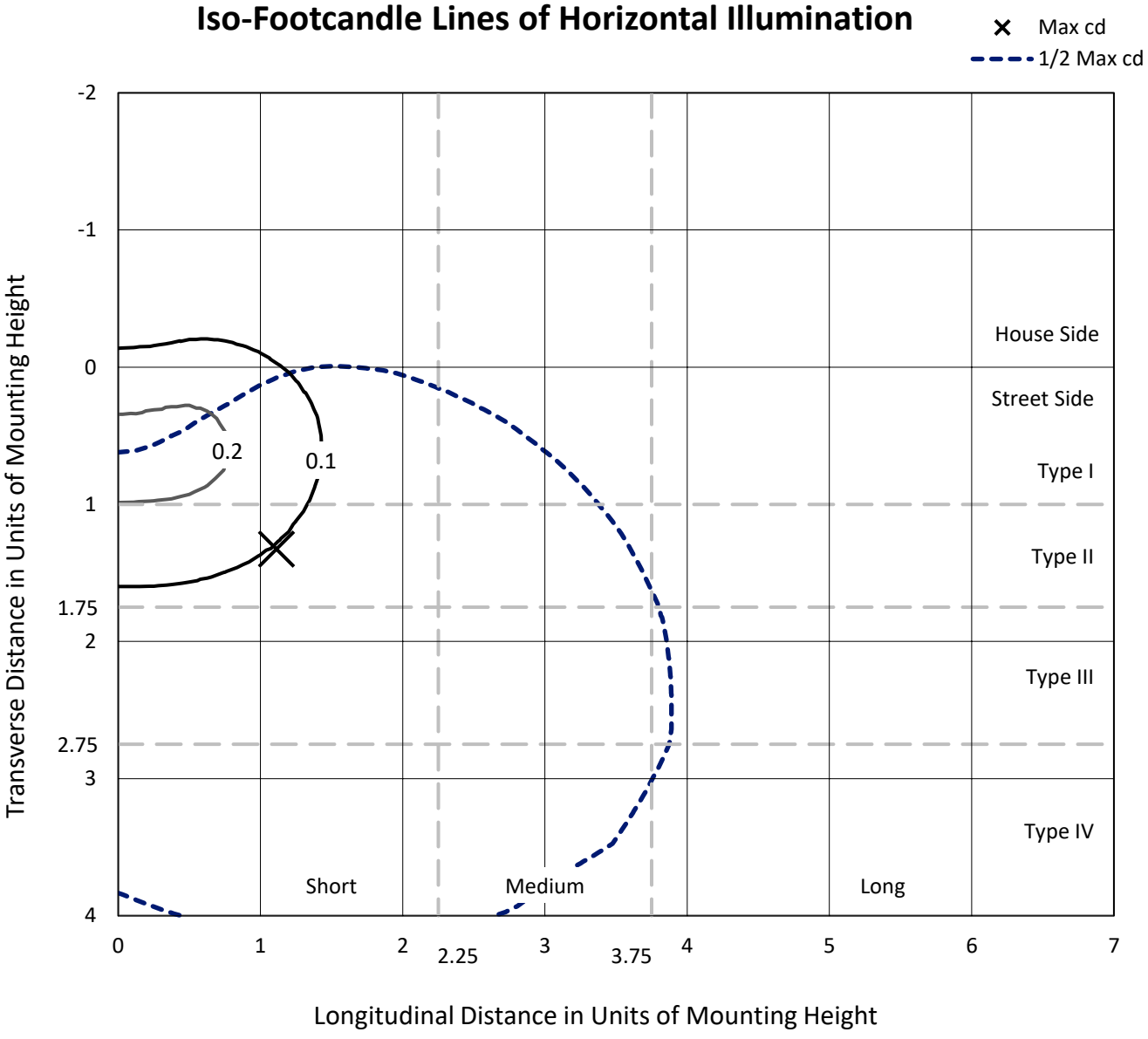
Iso-Footcandle Lines of Horizontal Illumination



Based on 25 foot mounting height. Maximum calculated value = 0.2 fc
Type IV - Short - N/A

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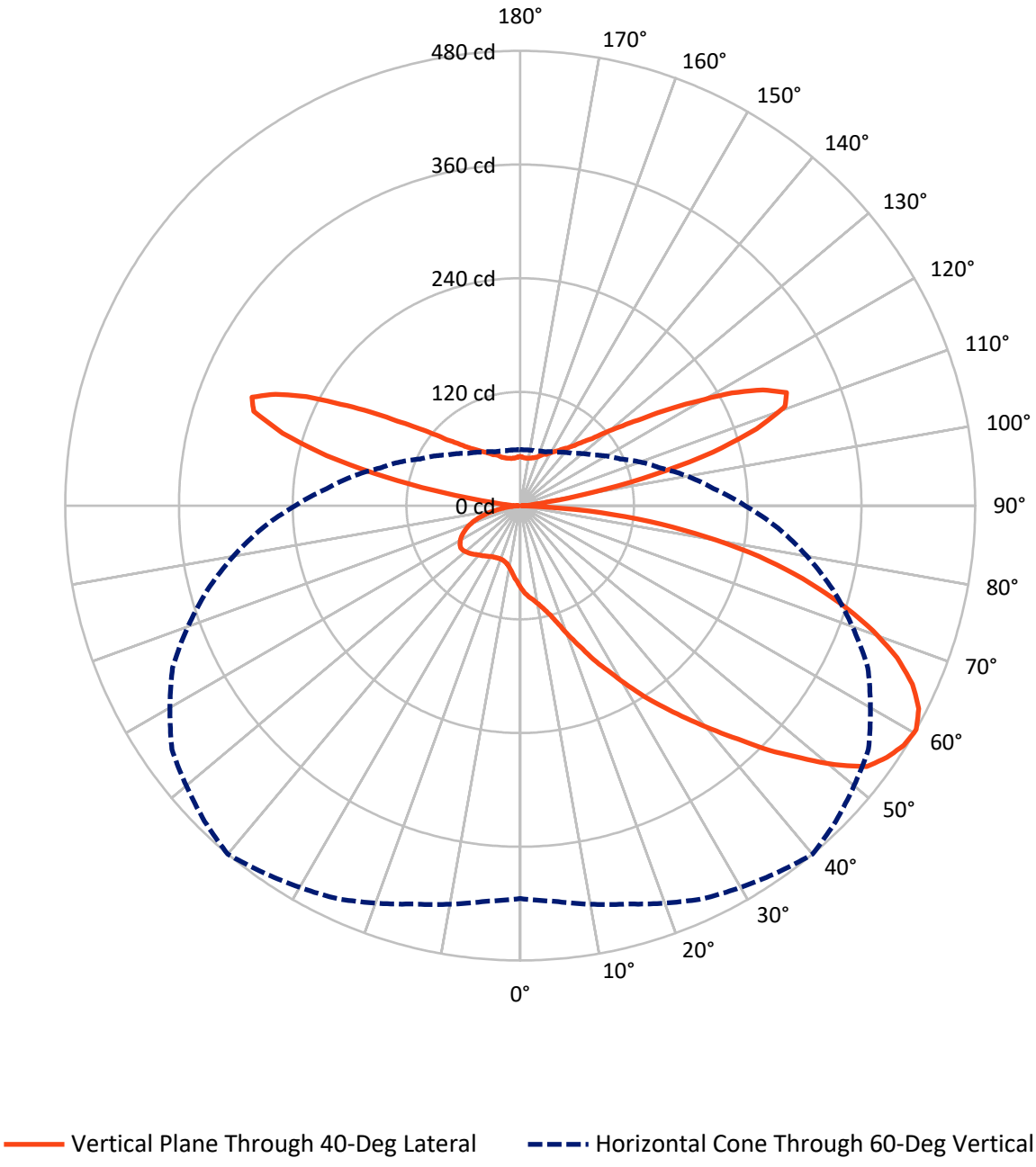
Luminous Intensity Polar Plot



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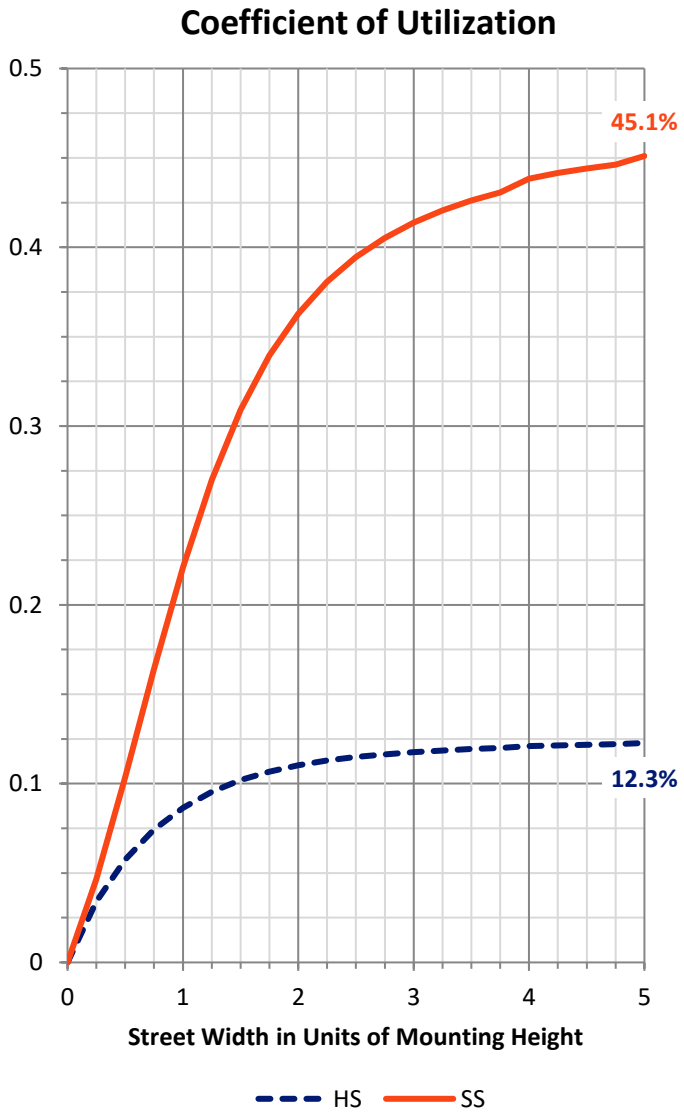
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	220.3	370.3	590.6
	% Fixture	12.4	20.9	33.3
Street Side	Lumens	812.7	370.3	1183.1
	% Fixture	45.8	20.9	66.7
Total	Lumens	1033.0	740.7	1773.7
	% Fixture	58.2	41.8	100.0

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	8.2	0.5
10°-20°	26.2	1.5
20°-30°	55.3	3.1
30°-40°	101.0	5.7
40°-50°	164.1	9.3
50°-60°	228.1	12.9
60°-70°	236.5	13.3
70°-80°	169.5	9.6
80°-90°	44.2	2.5
90°-100°	16.5	0.9
100°-110°	168.0	9.5
110°-120°	245.6	13.8
120°-130°	142.5	8.0
130°-140°	75.5	4.3
140°-150°	44.9	2.5
150°-160°	27.6	1.6
160°-170°	15.1	0.8
170°-180°	4.9	0.3
0°-90°	1033.0	58.2
0°-180°	1773.7	100.0



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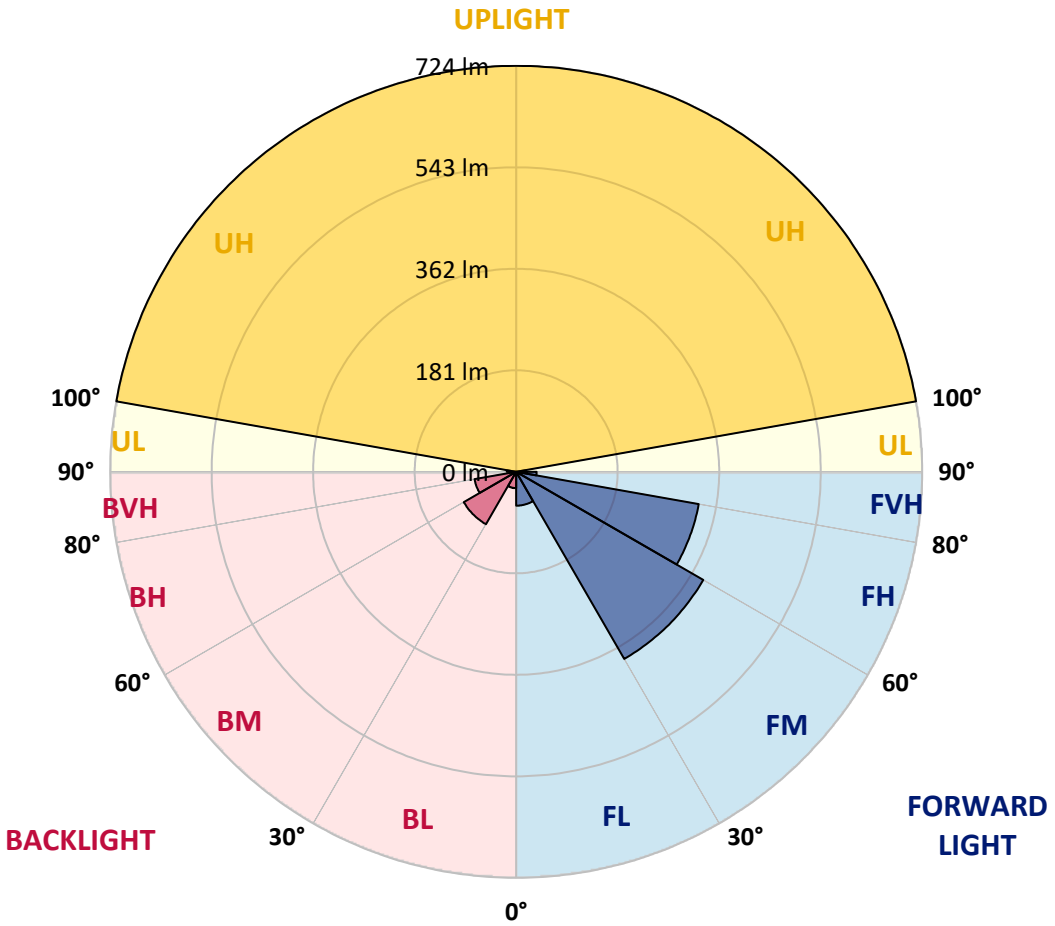
LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit B	U	G
FL	(0°-30°)	60.4	3.4			
FM	(30°-60°)	385.3	21.7			
FH	(60°-80°)	330.5	18.6			G0/660
FVH	(80°-90°)	36.5	2.1			G1/100
BL	(0°-30°)	29.2	1.6	B0/110		
BM	(30°-60°)	107.9	6.1	B0/220		
BH	(60°-80°)	75.4	4.3	B0/110		G0/110
BVH	(80°-90°)	7.7	0.4			G0/10
UL	(90°-100°)	16.5	0.9		U2/50	
UH	(100°-180°)	724.2	40.8		U4/1000	

BUG Rating: B0-U4-G1
Type IV Short



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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
0°	86.9	86.9	86.9	86.9	86.9	*86.9*	86.9	86.9	86.9	86.9	86.9
2.5°	93.2	93.2	93.2	93.2	92.3	*92.3*	91.4	90.5	89.6	88.7	86.9
5°	101.3	101.3	100.4	99.5	97.7	*96.8*	95.9	94.1	92.3	90.5	87.8
7.5°	104.8	104.8	104.8	103.9	101.3	*100.4*	98.6	95.9	93.2	90.5	86.9
10°	111.1	111.1	110.2	109.3	106.6	*105.7*	103.9	100.4	95.9	91.4	86.9
12.5°	119.2	118.3	117.4	116.5	113.8	*112.0*	109.3	105.7	100.4	95.0	89.6
15°	129.0	127.2	127.2	125.4	122.8	*120.1*	118.3	112.9	107.5	100.4	93.2
17.5°	139.8	138.9	138.0	136.2	133.5	*131.7*	129.0	122.8	115.6	106.6	98.6
20°	153.2	151.4	152.3	149.6	147.0	*146.1*	141.6	134.4	125.4	115.6	105.7
22.5°	169.4	167.6	167.6	164.9	163.1	*161.3*	156.8	148.7	137.1	126.3	113.8
25°	187.3	185.5	185.5	183.7	181.9	*180.1*	174.7	165.8	152.3	138.9	124.6
27.5°	207.0	205.2	205.2	204.3	199.8	*197.1*	192.7	182.8	169.4	152.3	135.3
30°	227.6	225.8	227.6	225.8	223.1	*217.7*	212.4	201.6	186.4	167.6	147.0
32.5°	243.7	243.7	244.6	246.4	244.6	*240.1*	233.9	224.9	204.3	181.0	157.7
35°	262.5	262.5	264.3	267.0	266.1	*261.6*	255.4	245.5	224.0	196.2	169.4
37.5°	283.2	283.2	284.9	289.4	287.6	*284.9*	280.5	267.9	243.7	211.5	181.9
40°	305.6	304.7	306.5	312.7	313.6	*310.0*	304.7	292.1	264.3	231.2	195.3
42.5°	328.0	327.1	330.6	336.9	337.8	*336.9*	331.5	317.2	285.8	250.9	208.8
45°	350.4	350.4	355.7	365.6	370.1	*368.3*	363.8	345.9	312.7	271.5	226.7
47.5°	373.7	373.7	380.8	393.4	398.7	*397.8*	396.1	374.6	338.7	293.0	241.9
50°	391.6	391.6	403.2	417.6	426.5	*430.1*	421.1	401.4	361.1	311.8	254.5
52.5°	409.5	409.5	421.1	443.5	452.5	*457.9*	446.2	425.6	386.2	328.9	266.1
55°	418.5	420.2	436.4	457.9	472.2	*469.5*	474.0	446.2	402.3	341.4	273.3
57.5°	419.4	422.0	440.0	462.4	478.5	*477.6*	478.5	453.4	408.6	344.1	274.2
60°	*414.9*	*419.4*	*435.5*	*457.9*	*473.1*	*480.3*	*471.3*	*448.9*	*405.0*	*341.4*	*273.3*
62.5°	404.1	413.1	430.1	447.1	469.5	*472.2*	465.1	446.2	395.2	338.7	268.8
65°	379.9	389.8	414.0	433.7	451.6	*455.2*	447.1	431.0	385.3	326.2	254.5
67.5°	355.7	362.0	382.6	413.1	425.6	*429.2*	426.5	407.7	368.3	301.1	237.5
70°	328.0	336.0	352.1	383.5	396.1	*395.2*	403.2	381.7	342.3	279.6	219.5
72.5°	290.3	302.0	318.1	344.1	359.3	*353.9*	366.5	348.6	308.2	252.7	195.3
75°	246.4	256.3	276.9	297.5	314.5	*308.2*	318.1	305.6	268.8	220.4	167.6
77.5°	197.1	208.8	227.6	246.4	258.1	*258.1*	262.5	251.8	223.1	181.0	137.1
80°	146.1	156.8	173.8	187.3	198.0	*198.9*	203.4	198.0	172.0	140.7	104.8
82.5°	96.8	102.2	117.4	128.1	138.9	*138.0*	145.2	141.6	120.1	96.8	69.9
85°	41.2	44.8	57.3	66.3	76.2	*72.6*	82.4	81.5	64.5	46.6	31.4
87.5°	1.8	2.7	2.7	1.8	2.7	*0.9*	2.7	3.6	2.7	1.8	1.8
90°	6.3	6.3	7.6	7.6	7.6	*7.6*	7.6	7.6	7.6	7.6	6.3
92.5°	6.3	6.3	6.3	8.9	10.1	*9.5*	8.9	10.1	7.6	7.6	6.3
95°	7.6	7.6	8.9	11.4	13.9	*14.6*	15.2	15.2	8.9	8.9	7.6
97.5°	10.1	11.4	11.4	13.9	22.8	*32.3*	41.8	25.3	12.7	12.7	11.4
100°	16.5	17.7	17.7	31.7	67.2	*78.6*	90.0	64.6	32.9	24.1	17.7
102.5°	53.2	55.8	68.4	102.6	152.1	*145.1*	138.1	116.6	110.2	76.0	60.8
105°	135.6	134.3	144.5	171.1	212.9	*211.0*	209.1	192.6	174.9	150.8	139.4
107.5°	178.7	178.7	187.5	210.4	242.0	*262.3*	282.6	286.4	226.8	198.9	186.3
110°	201.5	201.5	209.1	228.1	269.9	*298.4*	326.9	324.4	280.0	245.8	229.4

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REPORT NUMBER: P832959
CATALOG NUMBER: TTN-D0-830-U-DL-UPL3

CANDELA DISTRIBUTION (continued):

	0°	5°	15°	25°	35°	40°	45°	55°	65°	75°	85°
112.5°	206.5	207.8	218.0	247.1	292.7	*305.4*	318.1	306.7	288.9	273.7	261.0
115°	214.2	214.2	225.6	253.4	278.8	*283.8*	288.9	276.2	262.3	252.2	247.1
117.5°	211.6	215.4	218.0	233.2	249.6	*253.4*	257.2	250.9	231.9	224.3	221.8
120°	196.4	196.4	198.9	206.5	215.4	*217.3*	219.2	216.7	204.0	197.7	196.4
122.5°	174.9	176.1	174.9	178.7	185.0	*186.9*	188.8	186.3	176.1	173.6	173.6
125°	153.3	153.3	152.1	154.6	158.4	*157.8*	157.1	158.4	153.3	152.1	152.1
127.5°	138.1	136.9	134.3	135.6	136.9	*136.9*	136.9	138.1	133.1	134.3	135.6
130°	122.9	122.9	120.4	120.4	120.4	*119.1*	117.8	120.4	117.8	119.1	120.4
132.5°	109.0	109.0	105.2	103.9	103.9	*103.9*	103.9	105.2	103.9	106.4	109.0
135°	97.6	97.6	93.8	95.0	95.0	*94.4*	93.8	95.0	93.8	96.3	97.6
137.5°	88.7	88.7	86.2	86.2	86.2	*85.6*	84.9	86.2	86.2	87.4	90.0
140°	81.1	81.1	79.8	79.8	78.6	*79.2*	79.8	79.8	79.8	81.1	82.4
142.5°	77.3	76.0	74.8	73.5	74.8	*74.8*	74.8	74.8	73.5	74.8	77.3
145°	71.0	71.0	69.7	69.7	69.7	*70.4*	71.0	69.7	69.7	71.0	71.0
147.5°	67.2	67.2	65.9	67.2	67.2	*67.2*	67.2	67.2	65.9	67.2	67.2
150°	65.9	64.6	63.4	64.6	64.6	*64.0*	63.4	63.4	63.4	63.4	64.6
152.5°	62.1	62.1	60.8	62.1	60.8	*60.8*	60.8	60.8	60.8	60.8	62.1
155°	59.6	59.6	58.3	59.6	59.6	*59.6*	59.6	59.6	59.6	59.6	59.6
157.5°	57.0	58.3	57.0	57.0	57.0	*57.0*	57.0	57.0	57.0	57.0	58.3
160°	55.8	55.8	55.8	55.8	54.5	*54.5*	54.5	54.5	55.8	55.8	55.8
162.5°	54.5	54.5	54.5	54.5	53.2	*53.2*	53.2	53.2	53.2	54.5	54.5
165°	54.5	53.2	53.2	53.2	52.0	*52.0*	52.0	52.0	52.0	53.2	54.5
167.5°	52.0	52.0	52.0	52.0	52.0	*51.4*	50.7	50.7	52.0	52.0	52.0
170°	52.0	52.0	50.7	50.7	50.7	*50.7*	50.7	50.7	50.7	50.7	50.7
172.5°	52.0	52.0	52.0	52.0	50.7	*50.7*	50.7	50.7	50.7	50.7	52.0
175°	52.0	52.0	52.0	52.0	50.7	*50.7*	50.7	50.7	52.0	52.0	52.0
177.5°	52.0	52.0	52.0	52.0	50.7	*51.4*	52.0	52.0	52.0	52.0	52.0
180°	52.0	52.0	52.0	52.0	52.0	*52.0*	52.0	52.0	52.0	52.0	52.0

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CANDELA DISTRIBUTION (continued):

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9
2.5°	86.9	86.0	84.2	83.3	82.4	80.6	80.6	79.7	79.7	79.7	78.9
5°	86.9	85.1	83.3	80.6	78.9	77.1	75.3	73.5	72.6	72.6	71.7
7.5°	85.1	83.3	80.6	78.0	75.3	71.7	69.9	66.3	65.4	64.5	64.5
10°	85.1	83.3	78.9	75.3	71.7	68.1	65.4	61.8	59.1	58.2	58.2
12.5°	86.0	83.3	78.9	74.4	69.9	65.4	61.8	58.2	55.6	53.8	53.8
15°	89.6	86.0	80.6	74.4	69.0	63.6	60.0	55.6	52.9	51.1	51.1
17.5°	94.1	90.5	82.4	75.3	69.0	62.7	58.2	53.8	51.1	49.3	48.4
20°	100.4	95.0	86.0	76.2	69.0	62.7	57.3	52.9	49.3	47.5	47.5
22.5°	107.5	101.3	89.6	78.0	69.9	62.7	57.3	52.0	48.4	46.6	46.6
25°	116.5	108.4	95.0	81.5	71.7	63.6	57.3	52.0	48.4	46.6	46.6
27.5°	126.3	117.4	100.4	85.1	73.5	64.5	57.3	52.0	48.4	46.6	46.6
30°	135.3	125.4	105.7	88.7	76.2	65.4	58.2	52.9	49.3	47.5	46.6
32.5°	145.2	132.6	111.1	92.3	78.0	67.2	59.1	53.8	49.3	47.5	47.5
35°	155.0	141.6	116.5	96.8	80.6	69.0	60.0	54.7	50.2	48.4	48.4
37.5°	165.8	151.4	122.8	100.4	83.3	70.8	61.8	55.6	51.1	49.3	49.3
40°	178.3	161.3	129.0	104.8	86.0	72.6	62.7	57.3	52.9	51.1	51.1
42.5°	190.0	170.3	135.3	108.4	88.7	74.4	64.5	58.2	54.7	52.9	52.9
45°	201.6	181.0	141.6	112.9	91.4	77.1	66.3	60.9	56.5	54.7	54.7
47.5°	215.1	190.9	148.7	116.5	94.1	78.9	68.1	62.7	58.2	57.3	56.5
50°	225.8	198.0	153.2	120.1	95.9	80.6	69.9	63.6	60.0	58.2	58.2
52.5°	235.7	205.2	156.8	121.9	96.8	81.5	71.7	65.4	61.8	60.0	60.0
55°	241.0	207.9	159.5	121.9	97.7	82.4	71.7	65.4	61.8	60.9	60.0
57.5°	241.0	207.9	157.7	120.1	95.9	80.6	70.8	64.5	61.8	60.0	60.0
60°	*237.5*	*205.2*	*153.2*	*116.5*	*93.2*	*78.0*	*69.0*	*62.7*	*60.0*	*59.1*	*59.1*
62.5°	232.1	200.7	149.6	112.0	89.6	74.4	66.3	60.0	58.2	58.2	57.3
65°	217.7	187.3	141.6	105.7	84.2	69.9	62.7	57.3	55.6	54.7	53.8
67.5°	202.5	174.7	129.0	98.6	77.1	65.4	58.2	53.8	51.1	51.1	50.2
70°	187.3	161.3	117.4	88.7	69.0	60.0	52.9	48.4	46.6	46.6	46.6
72.5°	166.7	144.3	103.9	78.0	60.9	52.9	47.5	43.0	42.1	42.1	41.2
75°	142.5	122.8	87.8	66.3	51.1	44.8	40.3	35.8	35.8	35.8	35.8
77.5°	116.5	99.5	69.9	52.9	40.3	35.8	33.2	29.6	29.6	29.6	29.6
80°	87.8	73.5	51.1	38.5	29.6	26.0	24.2	22.4	23.3	23.3	22.4
82.5°	57.3	48.4	32.3	24.2	18.8	17.0	17.0	15.2	16.1	16.1	16.1
85°	25.1	21.5	13.4	10.8	9.0	9.0	9.0	8.1	9.0	9.0	9.0
87.5°	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0	0.9	1.8	0.9
90°	6.3	6.3	7.6	7.6	7.6	7.6	7.6	7.6	7.6	6.3	6.3
92.5°	6.3	6.3	7.6	7.6	10.1	8.9	10.1	8.9	6.3	6.3	6.3
95°	7.6	7.6	8.9	8.9	15.2	15.2	13.9	11.4	8.9	7.6	7.6
97.5°	10.1	11.4	12.7	12.7	25.3	41.8	22.8	13.9	11.4	11.4	10.1
100°	17.7	17.7	24.1	32.9	64.6	90.0	67.2	31.7	17.7	17.7	16.5
102.5°	58.3	60.8	76.0	110.2	116.6	138.1	152.1	102.6	68.4	55.8	53.2
105°	139.4	139.4	150.8	174.9	192.6	209.1	212.9	171.1	144.5	134.3	135.6
107.5°	185.0	186.3	198.9	226.8	286.4	282.6	242.0	210.4	187.5	178.7	178.7
110°	226.8	229.4	245.8	280.0	324.4	326.9	269.9	228.1	209.1	201.5	201.5

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

Scaled Data Report

REPORT NUMBER: P832959
CATALOG NUMBER: TTN-D0-830-U-DL-UPL3

CANDELA DISTRIBUTION (continued):

	90°	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
112.5°	258.5	261.0	273.7	288.9	306.7	318.1	292.7	247.1	218.0	207.8	206.5
115°	249.6	247.1	252.2	262.3	276.2	288.9	278.8	253.4	225.6	214.2	214.2
117.5°	218.0	221.8	224.3	231.9	250.9	257.2	249.6	233.2	218.0	215.4	211.6
120°	193.9	196.4	197.7	204.0	216.7	219.2	215.4	206.5	198.9	196.4	196.4
122.5°	171.1	173.6	173.6	176.1	186.3	188.8	185.0	178.7	174.9	176.1	174.9
125°	150.8	152.1	152.1	153.3	158.4	157.1	158.4	154.6	152.1	153.3	153.3
127.5°	134.3	135.6	134.3	133.1	138.1	136.9	136.9	135.6	134.3	136.9	138.1
130°	121.6	120.4	119.1	117.8	120.4	117.8	120.4	120.4	120.4	122.9	122.9
132.5°	109.0	109.0	106.4	103.9	105.2	103.9	103.9	103.9	105.2	109.0	109.0
135°	97.6	97.6	96.3	93.8	95.0	93.8	95.0	95.0	93.8	97.6	97.6
137.5°	91.2	90.0	87.4	86.2	86.2	84.9	86.2	86.2	86.2	88.7	88.7
140°	82.4	82.4	81.1	79.8	79.8	79.8	78.6	79.8	79.8	81.1	81.1
142.5°	77.3	77.3	74.8	73.5	74.8	74.8	74.8	73.5	74.8	76.0	77.3
145°	72.2	71.0	71.0	69.7	69.7	71.0	69.7	69.7	69.7	71.0	71.0
147.5°	68.4	67.2	67.2	65.9	67.2	67.2	67.2	67.2	65.9	67.2	67.2
150°	64.6	64.6	63.4	63.4	63.4	63.4	64.6	64.6	63.4	64.6	65.9
152.5°	63.4	62.1	60.8	60.8	60.8	60.8	60.8	62.1	60.8	62.1	62.1
155°	59.6	59.6	59.6	59.6	59.6	59.6	59.6	59.6	58.3	59.6	59.6
157.5°	58.3	58.3	57.0	57.0	57.0	57.0	57.0	57.0	57.0	58.3	57.0
160°	57.0	55.8	55.8	55.8	54.5	54.5	54.5	55.8	55.8	55.8	55.8
162.5°	55.8	54.5	54.5	53.2	53.2	53.2	53.2	54.5	54.5	54.5	54.5
165°	53.2	54.5	53.2	52.0	52.0	52.0	52.0	53.2	53.2	53.2	54.5
167.5°	53.2	52.0	52.0	52.0	50.7	50.7	52.0	52.0	52.0	52.0	52.0
170°	52.0	50.7	50.7	50.7	50.7	50.7	50.7	50.7	50.7	52.0	52.0
172.5°	52.0	52.0	50.7	50.7	50.7	50.7	50.7	52.0	52.0	52.0	52.0
175°	50.7	52.0	52.0	52.0	50.7	50.7	50.7	52.0	52.0	52.0	52.0
177.5°	52.0	52.0	52.0	52.0	52.0	52.0	50.7	52.0	52.0	52.0	52.0
180°	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0

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

MCGRAW EDISON

Report Number: SP1-2411-284-4

Test Date: 11/22/2024

Luminaire Tested: TTN-D0-830-U-WQ

Data in this report applies to TT and TTN families of products

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

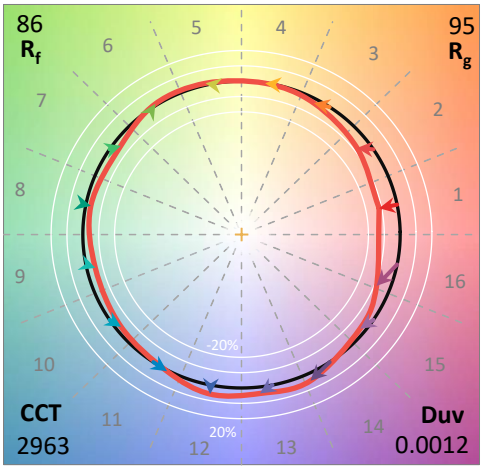
Test Information

Test Method:	LM-79-2019
Report Number:	SP1-2411-284-4
Test Lab:	COOPER LIGHTING SOLUTIONS
Photometer:	SP1 - 76IN SPHERE
Measurement Geometry:	4π
Issue Date:	11/22/2024
Manufacturer:	COOPER LIGHTING SOLUTIONS
Product Line:	MCGRAW EDISON
Catalog Number:	**TTN-D0-830-U-WQ**
Description:	TOPTIER NANO LED PARKING GARAGE LUMINAIRE. 3000K, 80 CRI LEDS AND WIDE DISTRIBUTION

Spectral Parameters

CCT (K):	2963
CIE u':	0.2515
CIE v':	0.5238
Duv:	0.0012
CIE x:	0.4414
CIE y:	0.4086
CIE z:	0.1501
Peak Wavelength (nm):	603
Dominant Wavelength (nm):	582
Purity:	55.12798
Rf:	86.1
Rg:	94.9

CRI (Ra):	82.9
R1:	81.4
R2:	91.9
R3:	95.2
R4:	81.6
R5:	82.3
R6:	91.4
R7:	82.0
R8:	57.2
R9:	3.9
R10:	82.5
R11:	82.3
R12:	76.5
R13:	83.9
R14:	97.8
R15:	72.6



Test Conditions

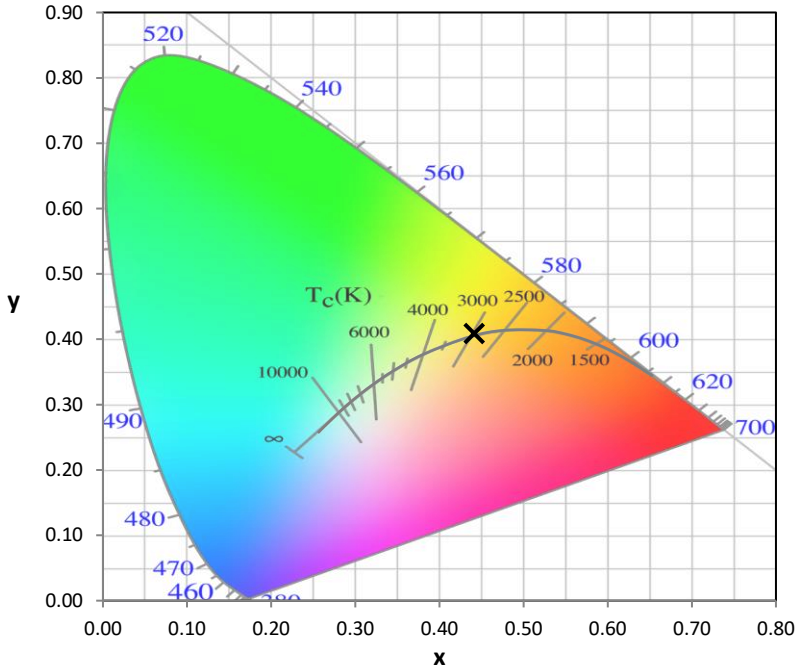
Stabilization Time:	37M
Operation Time:	1H 37M
Sphere Temperature (°C):	25.0

REPORT NUMBER: SP1-2411-284-4

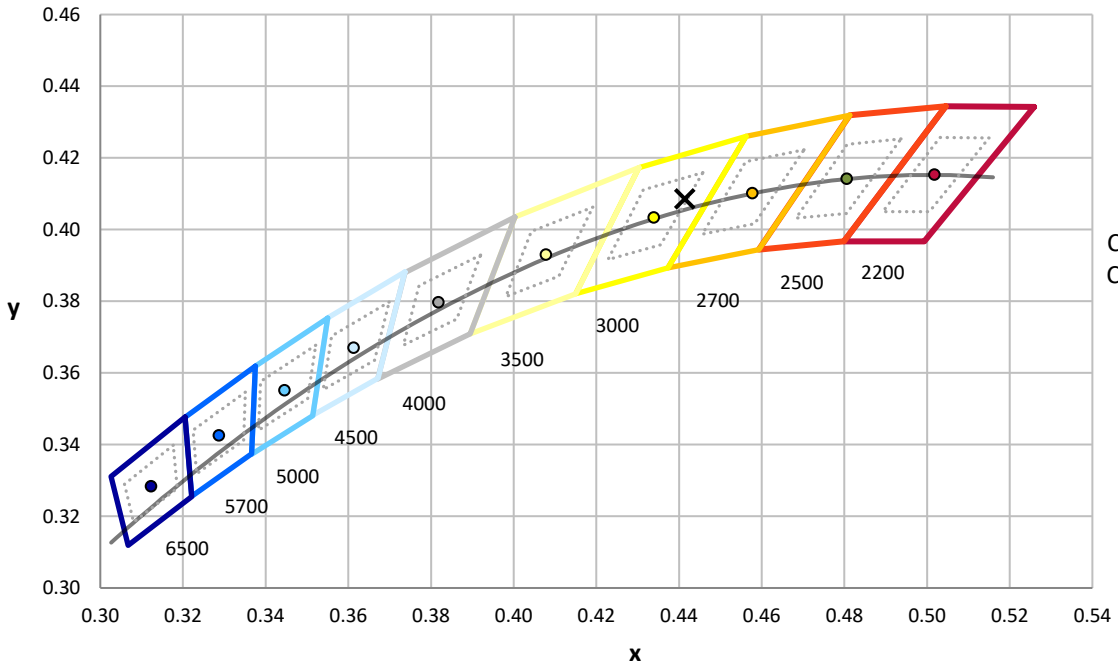
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085	10/22/2024	10/22/2025
Room Thermometer	IN0046	10/22/2024	10/22/2025

REPORT NUMBER: SP1-2411-284-4

CIE 1931 Chromaticity Diagram



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

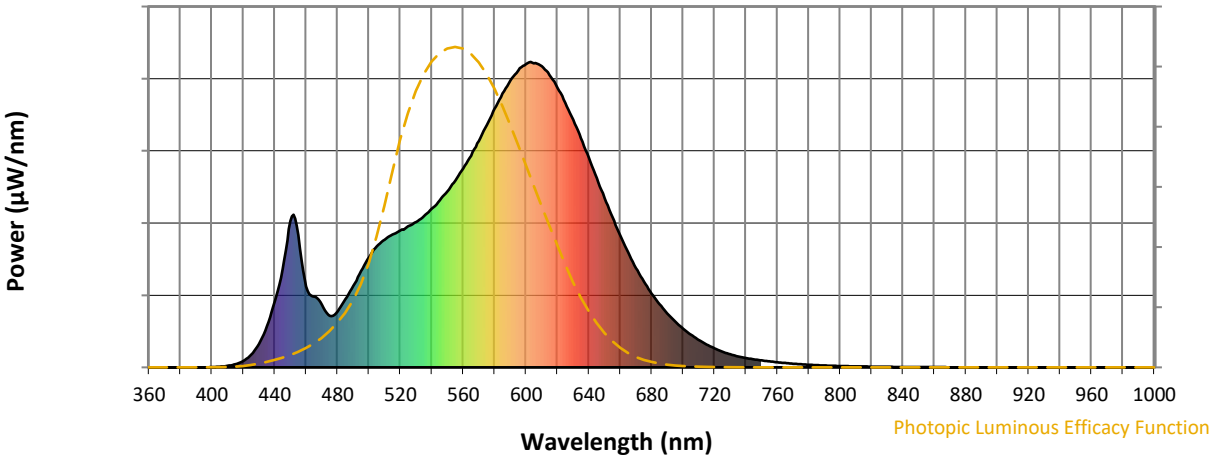


CCT = 2963K
CIE x = 0.4414
CIE y = 0.4086
Duv = 0.0012

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2411-284-4

Photopic Flux vs. Wavelength

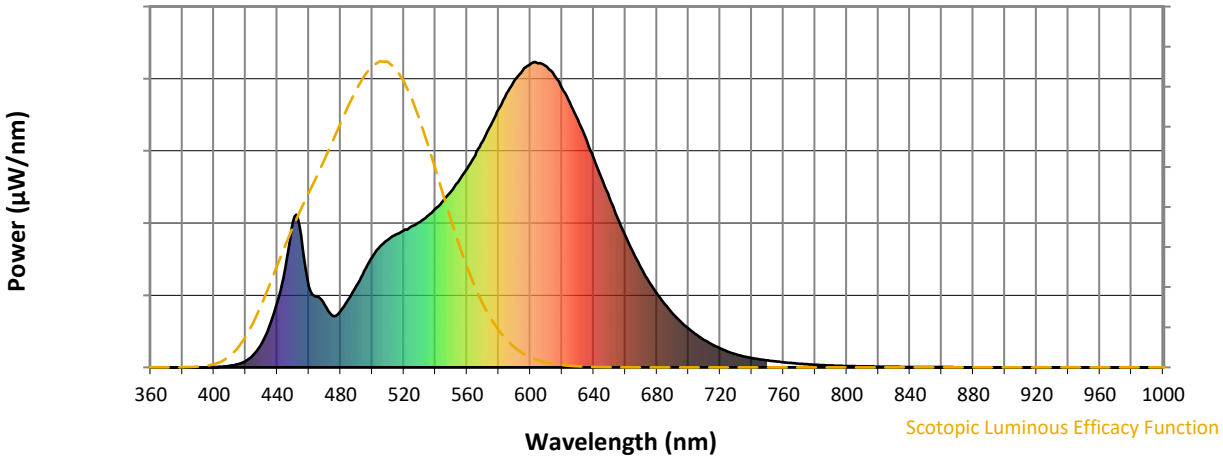


Photopic Lumens: NR

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	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

REPORT NUMBER: SP1-2411-284-4

Scotopic Flux vs. Wavelength

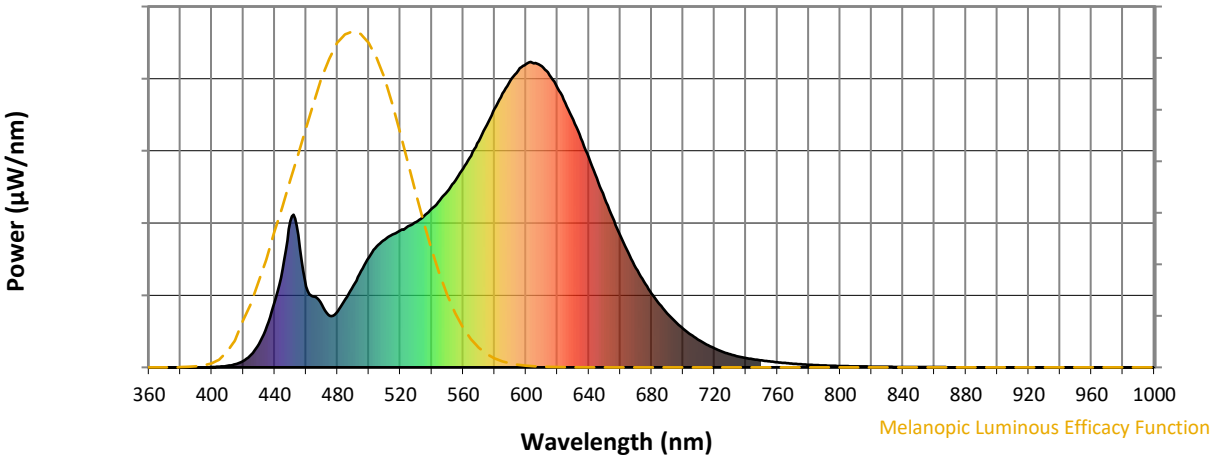


Scotopic Lumens: NR **S/P: 1.34**

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	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

REPORT NUMBER: SP1-2411-284-4

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR **M/P: 2.58**

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	267	NR	620	915	NR	750	23	NR	880	0	NR
365	0	NR	495	315	NR	625	866	NR	755	20	NR	885	0	NR
370	0	NR	500	360	NR	630	811	NR	760	17	NR	890	0	NR
375	0	NR	505	396	NR	635	750	NR	765	14	NR	895	0	NR
380	0	NR	510	418	NR	640	686	NR	770	12	NR	900	0	NR
385	0	NR	515	435	NR	645	619	NR	775	10	NR	905	0	NR
390	0	NR	520	448	NR	650	554	NR	780	9	NR	910	0	NR
395	0	NR	525	462	NR	655	491	NR	785	7	NR	915	0	NR
400	1	NR	530	476	NR	660	431	NR	790	6	NR	920	0	NR
405	2	NR	535	495	NR	665	376	NR	795	5	NR	925	0	NR
410	5	NR	540	520	NR	670	325	NR	800	4	NR	930	0	NR
415	10	NR	545	547	NR	675	280	NR	805	4	NR	935	0	NR
420	21	NR	550	576	NR	680	241	NR	810	3	NR	940	0	NR
425	42	NR	555	612	NR	685	207	NR	815	3	NR	945	0	NR
430	77	NR	560	651	NR	690	176	NR	820	2	NR	950	0	NR
435	135	NR	565	693	NR	695	149	NR	825	2	NR	955	0	NR
440	215	NR	570	741	NR	700	127	NR	830	2	NR	960	0	NR
445	321	NR	575	793	NR	705	107	NR	835	2	NR	965	0	NR
450	479	NR	580	847	NR	710	89	NR	840	1	NR	970	0	NR
455	432	NR	585	897	NR	715	75	NR	845	1	NR	975	0	NR
460	265	NR	590	940	NR	720	62	NR	850	1	NR	980	0	NR
465	231	NR	595	971	NR	725	51	NR	855	1	NR	985	0	NR
470	204	NR	600	993	NR	730	43	NR	860	1	NR	990	0	NR
475	168	NR	605	996	NR	735	36	NR	865	1	NR	995	0	NR
480	183	NR	610	986	NR	740	31	NR	870	1	NR	1000	0	NR
485	223	NR	615	957	NR	745	26	NR	875	0	NR			

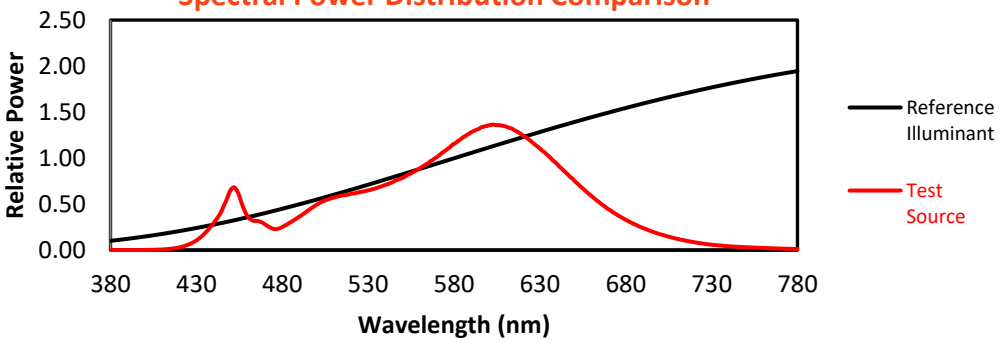
REPORT NUMBER: SP1-2411-284-4

TM-30-18

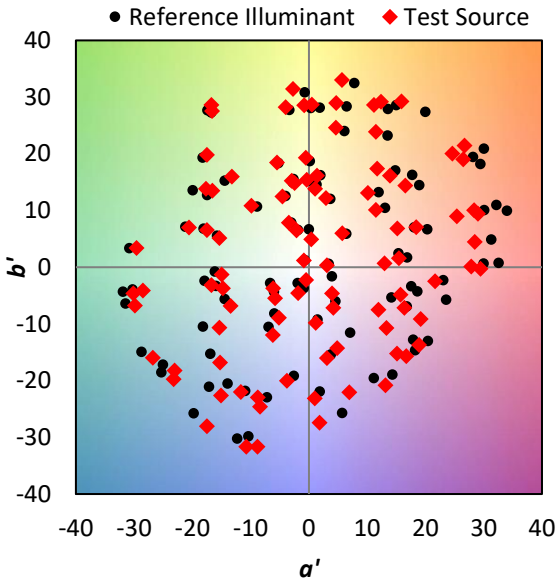
Summary

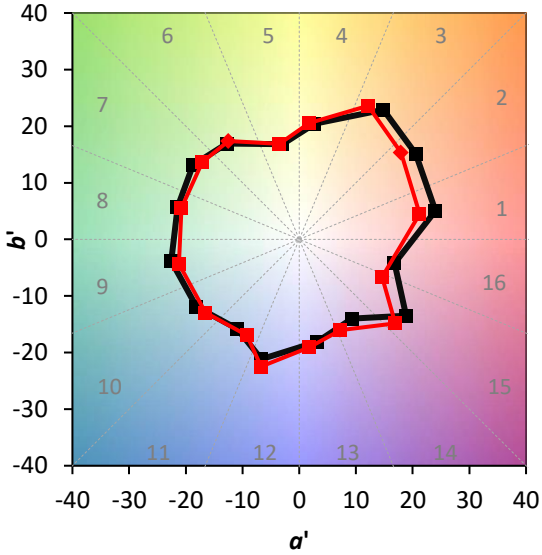
R_f = 86.1
R_g = 94.9
CIE R_a = 82.9
R_9 = 3.9

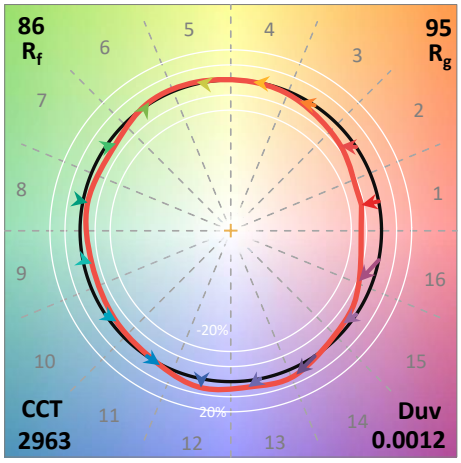
Spectral Power Distribution Comparison

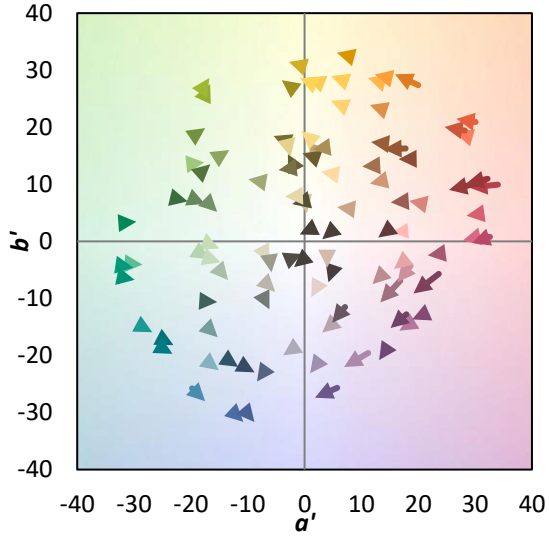


Color Vector Graphics







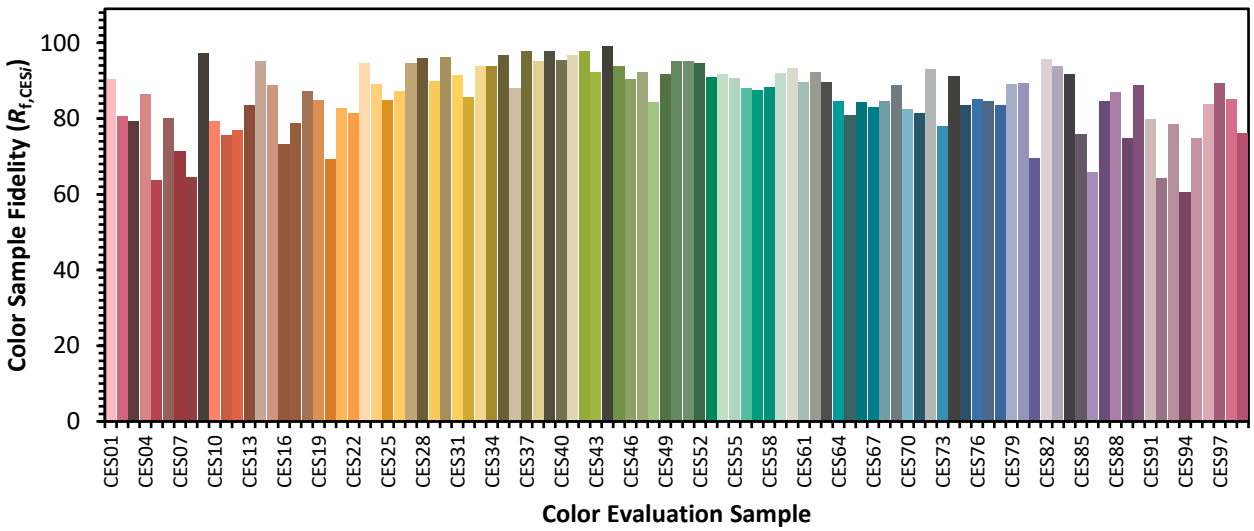


REPORT NUMBER: SP1-2411-284-4

TM-30-18

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

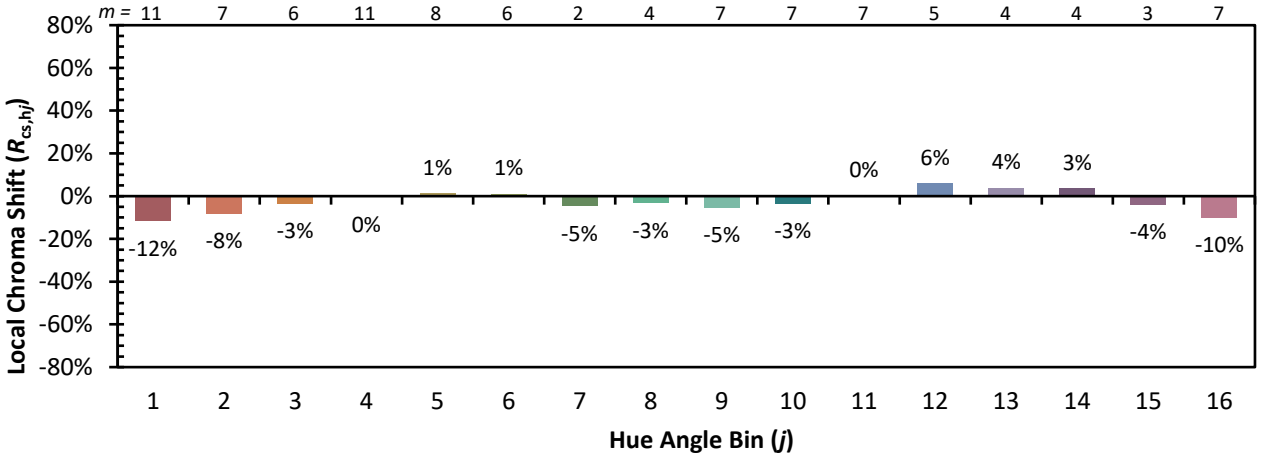
CES01 = 86	CES26 = 87	CES51 = 95	CES76 = 85
CES02 = 63	CES27 = 95	CES52 = 95	CES77 = 85
CES03 = 31	CES28 = 96	CES53 = 91	CES78 = 83
CES04 = 70	CES29 = 90	CES54 = 92	CES79 = 89
CES05 = 50	CES30 = 96	CES55 = 91	CES80 = 89
CES06 = 51	CES31 = 92	CES56 = 88	CES81 = 70
CES07 = 42	CES32 = 86	CES57 = 87	CES82 = 96
CES08 = 41	CES33 = 94	CES58 = 88	CES83 = 94
CES09 = 29	CES34 = 94	CES59 = 92	CES84 = 92
CES10 = 76	CES35 = 97	CES60 = 93	CES85 = 76
CES11 = 59	CES36 = 88	CES61 = 90	CES86 = 66
CES12 = 65	CES37 = 98	CES62 = 92	CES87 = 85
CES13 = 44	CES38 = 95	CES63 = 90	CES88 = 87
CES14 = 74	CES39 = 98	CES64 = 85	CES89 = 75
CES15 = 72	CES40 = 96	CES65 = 81	CES90 = 89
CES16 = 48	CES41 = 97	CES66 = 84	CES91 = 80
CES17 = 50	CES42 = 98	CES67 = 83	CES92 = 64
CES18 = 57	CES43 = 92	CES68 = 85	CES93 = 79
CES19 = 72	CES44 = 99	CES69 = 89	CES94 = 61
CES20 = 67	CES45 = 94	CES70 = 83	CES95 = 75
CES21 = 87	CES46 = 91	CES71 = 81	CES96 = 84
CES22 = 79	CES47 = 92	CES72 = 93	CES97 = 89
CES23 = 92	CES48 = 84	CES73 = 78	CES98 = 85
CES24 = 91	CES49 = 92	CES74 = 91	CES99 = 76
CES25 = 72	CES50 = 95	CES75 = 84	

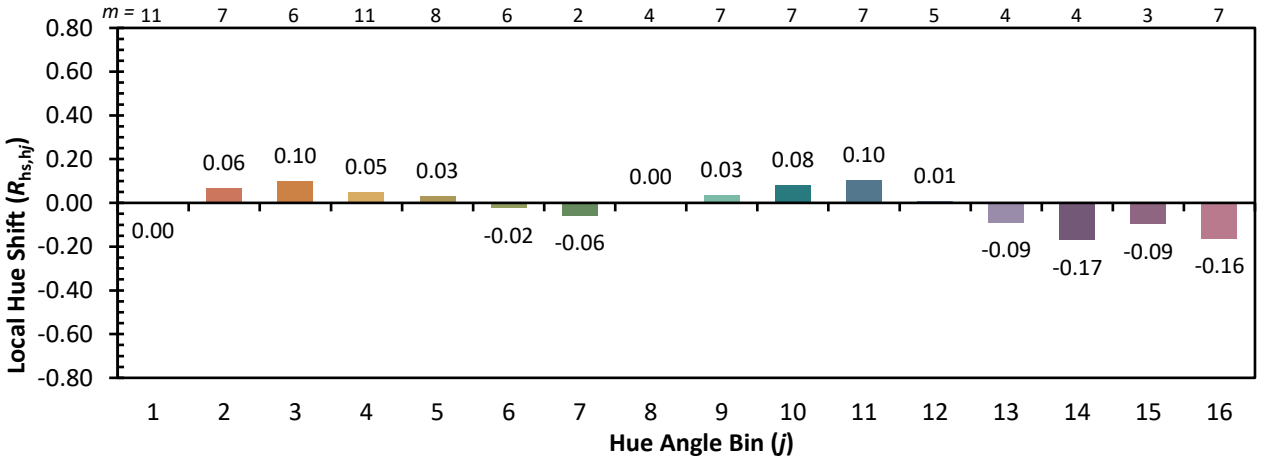


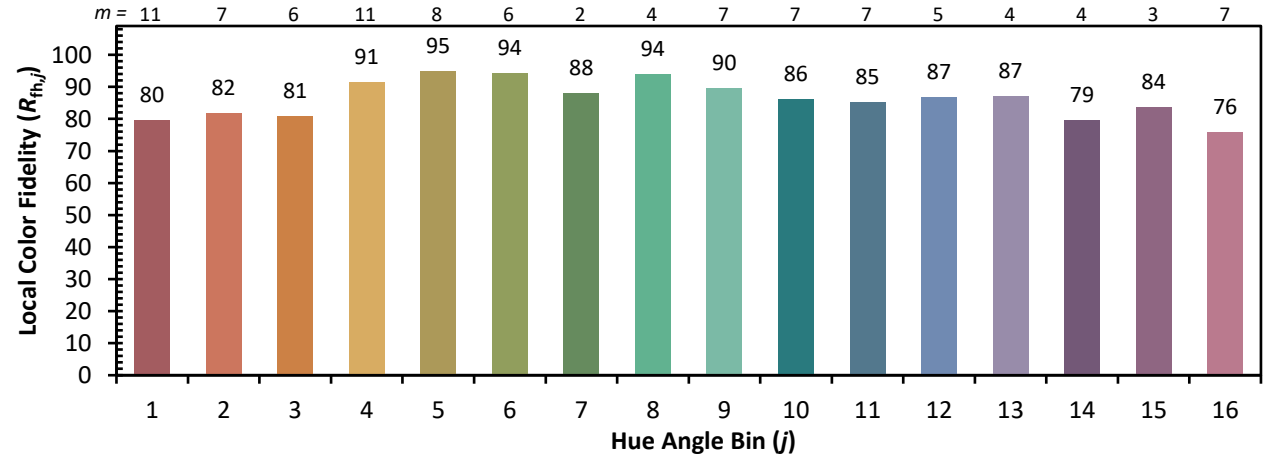
REPORT NUMBER: SP1-2411-284-4

TM-30-18

Color Rendition by Hue-Angle Bin







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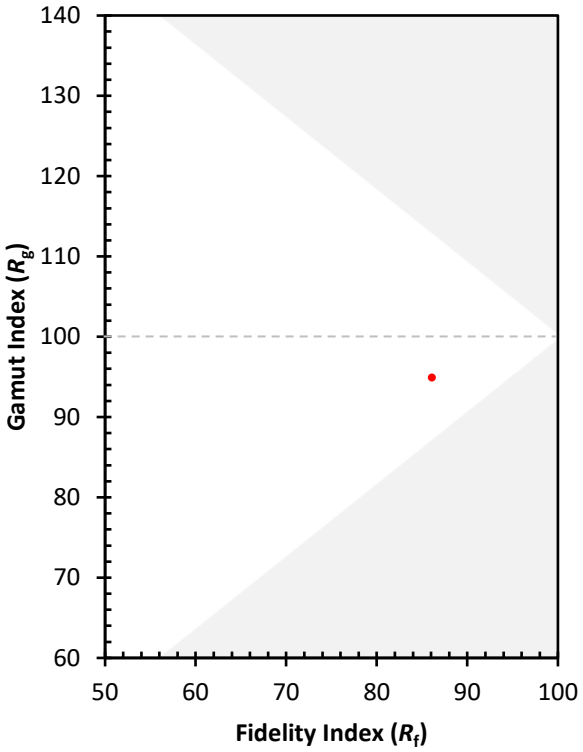
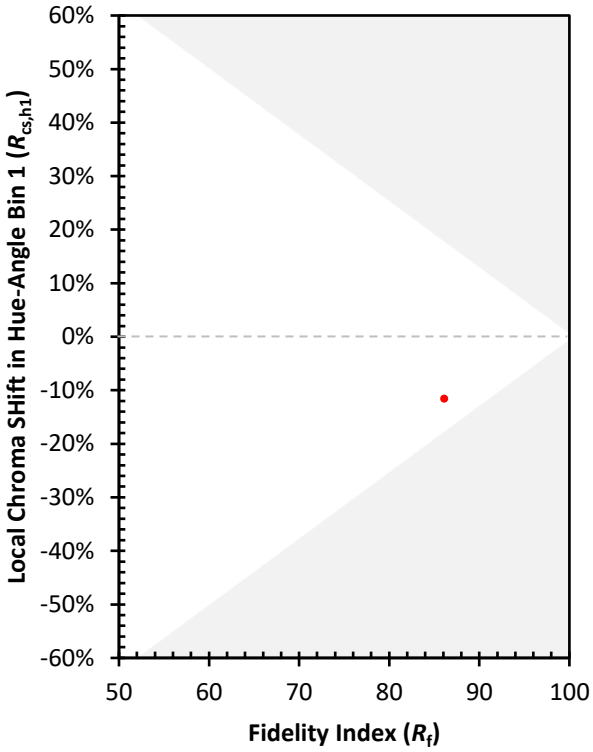
Measure Comparisons





(END OF REPORT)