

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



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: LUMARK

Report Number: P855620

Luminaire Tested: **NHRS100UBZ740-75%**

Issue Date: 07/17/2024

Test Information

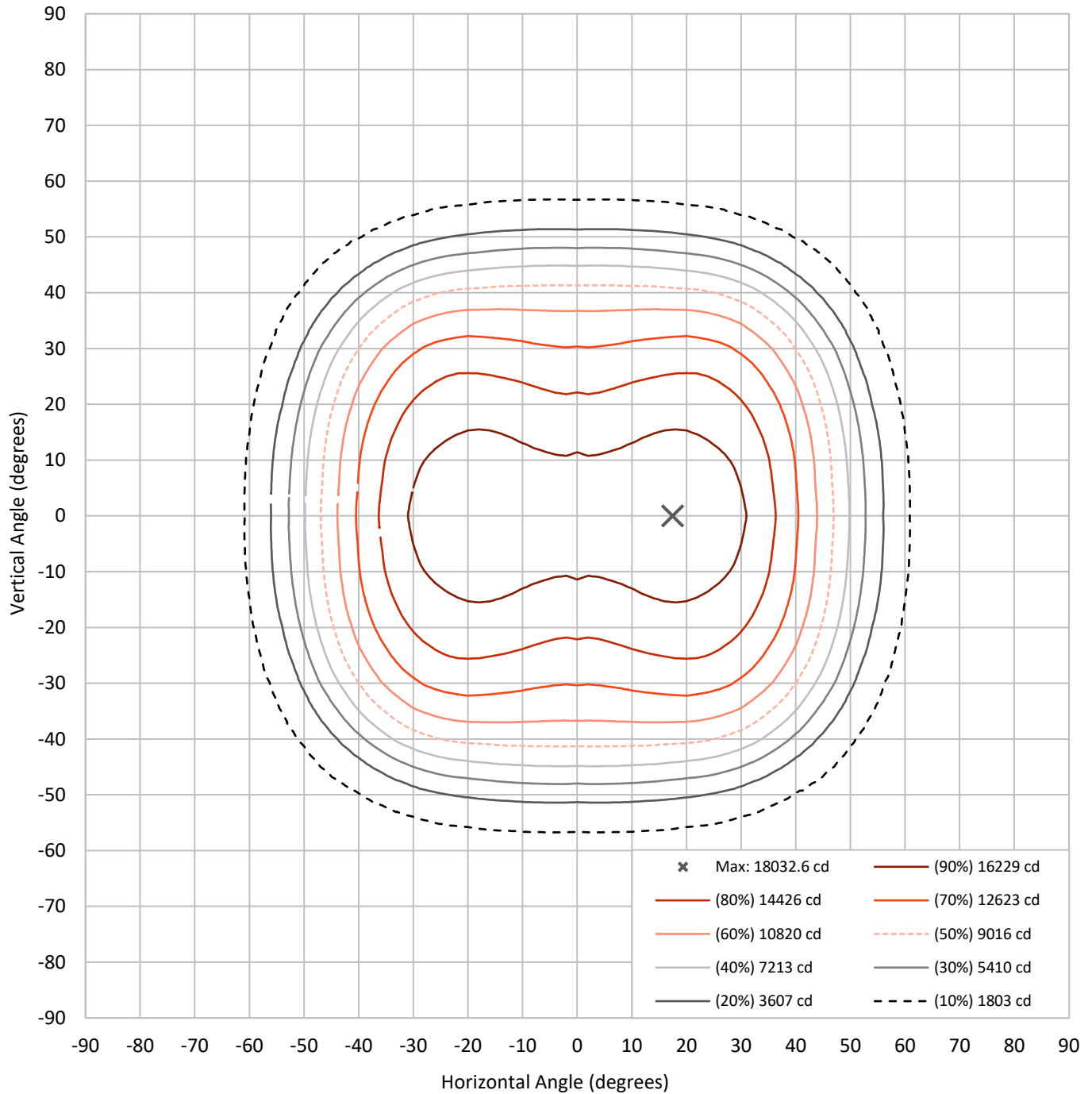
Test Method: LM-79-2019
Report Number: P855620
Test Lab: INNOVATION CENTER(G2)
Issue Date: 07/17/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: LUMARK
Catalog Number: NHRS100UBZ740-75%
Description: LUMARK NIGHT HARRIER 4 PANEL FLOOD SELECTABLE CCT NEMA6 @4000K 75%
Output
Light Source: (256) 4000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp:	N/A	NEMA Type:	6H x 6V
Luminaire Lumens:	34038.3 lumens	Max Intensity:	18032.6 candela
Efficiency:	N/A	Max Intensity Angle:	17.5°H x 0°V
Efficacy:	159.2 lumens/watt		
Luminous Opening:	Rectangular (W 1.29' x L: 1.12' x H: 0')		
Beam Angle (50%):	93.8°H x 81.7°V	Field Angle (10%):	121.7°H x 112.3°V
Beam Lumens:	20068 lumens	Field Lumens:	24412.9 lumens
Beam Efficiency:	59.0%	Field Efficiency:	71.7%
Input Watts (W):	213.8		
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:	28.75 FT		

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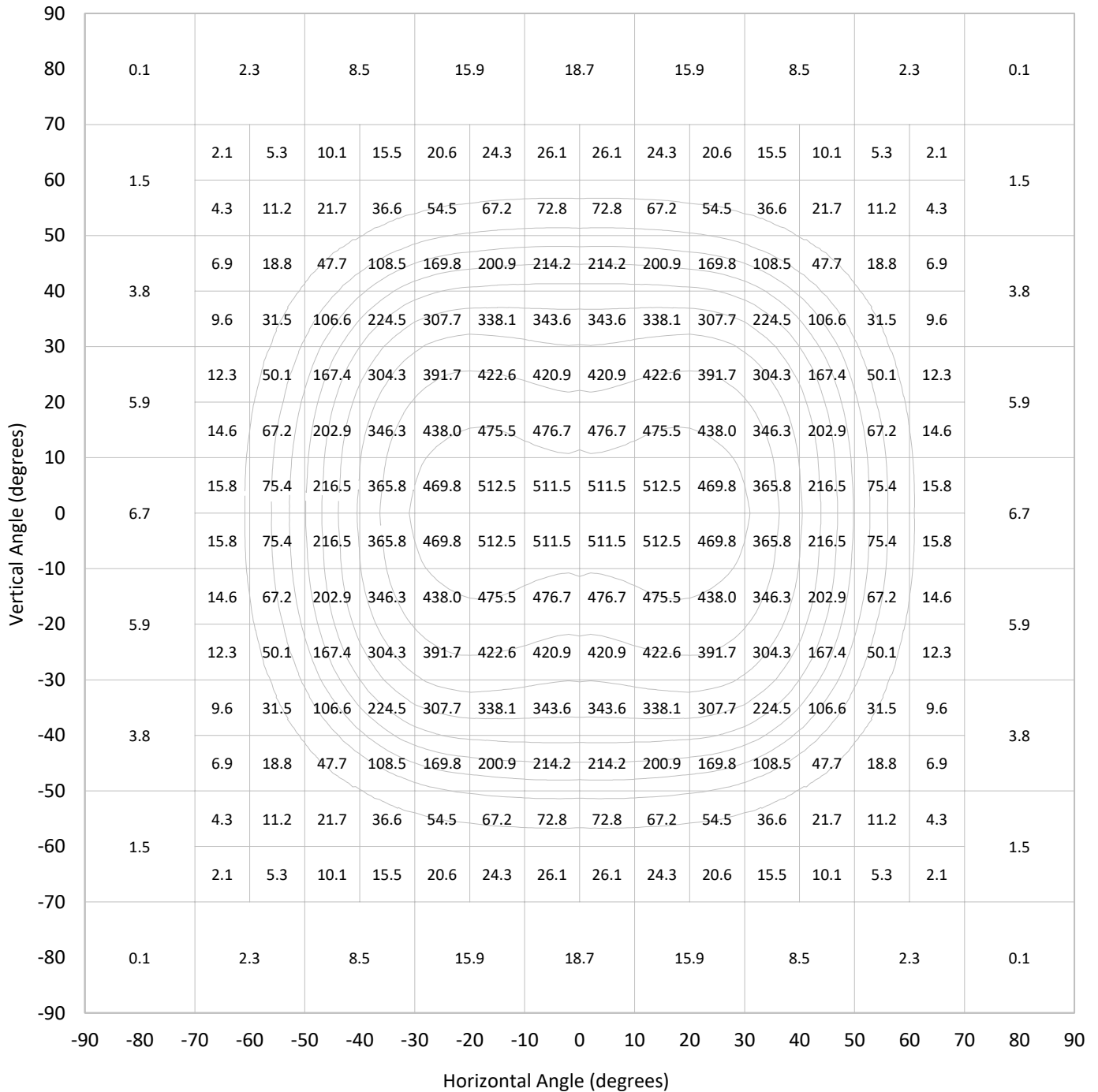
Iso-Candela Plot





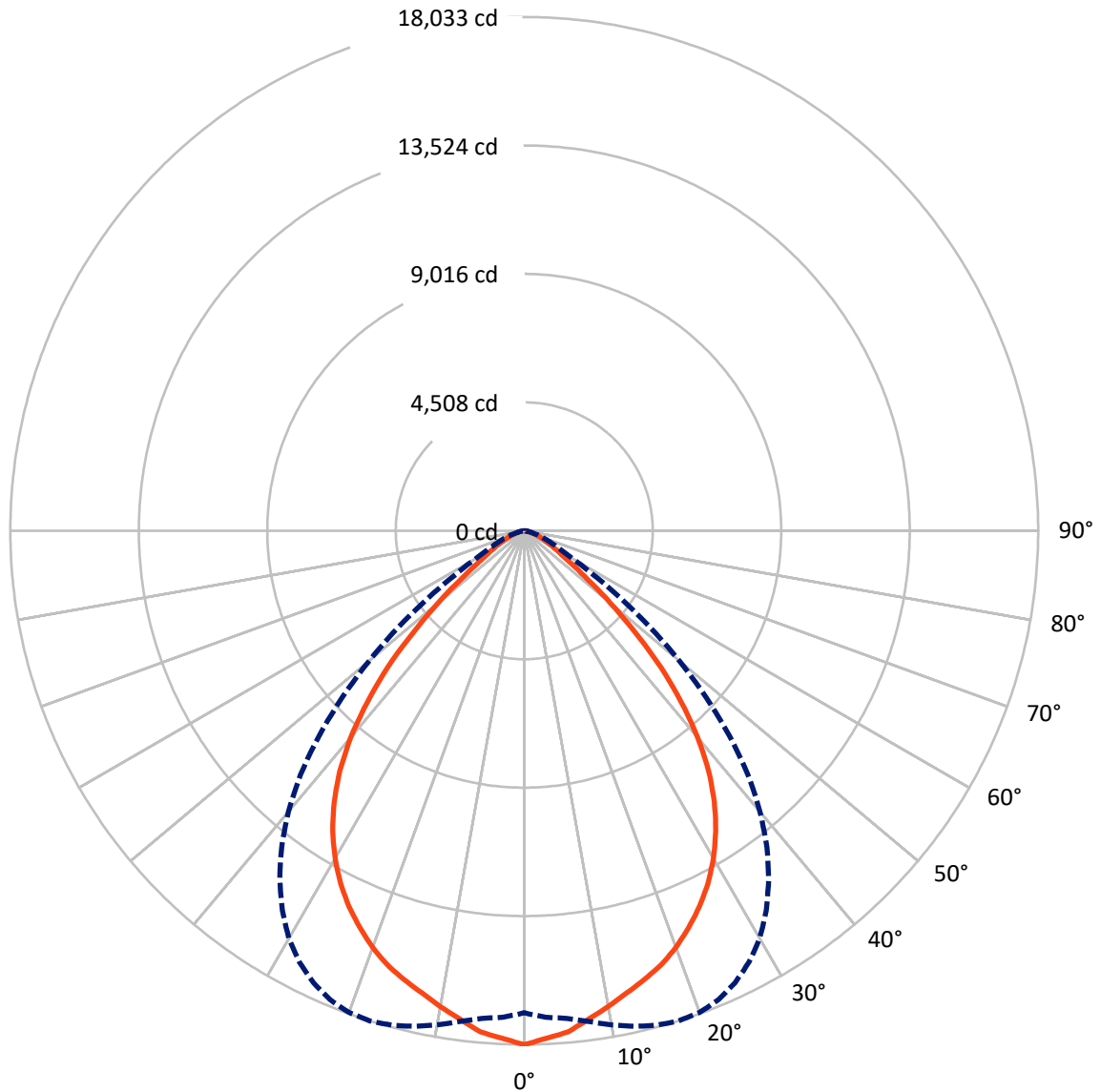
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Lumen Table



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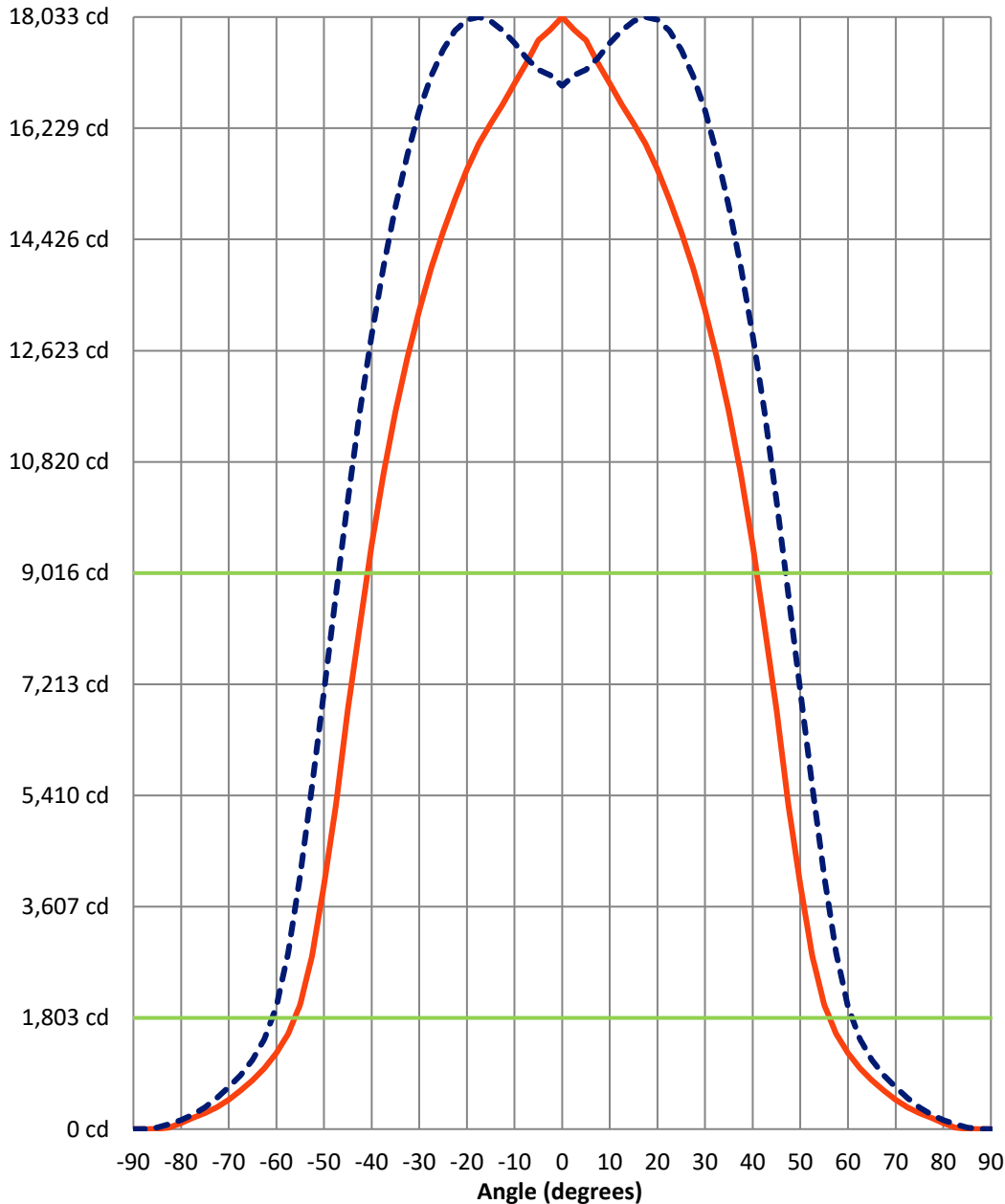
Luminous Intensity Polar Plot



— Vertical Distribution Through 17.5-Deg - - - Horizontal Distribution Through 0-Deg

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Luminous Intensity Plot



Beam:
 H Angle: 93.8°
 V Angle: 81.7°
 Lumens: 20068
 Efficiency: 59.0%

Field:
 H Angle: 121.7°
 V Angle: 112.3°
 Lumens: 24412.9
 Efficiency: 71.7%

Spill:
 Lumens: 9625.4
 Efficiency: 28.3%

— Vertical Distribution through 17.5-Deg
 - - - Horizontal Distribution through 0-Deg



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FIELD
 BEAM

CANDELA DISTRIBUTION:

	0°	2.5°	5°	7.5°	10°	12.5°	15°	17.5°	20°	22.5°	25°
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	4.0	4.0
82.5°	24.1	24.9	25.7	25.7	24.9	24.9	24.1	24.9	25.7	25.7	25.7
80°	95.5	98.7	101.9	104.3	101.1	100.3	98.7	97.1	94.7	91.5	87.5
77.5°	196.7	199.9	202.3	199.1	196.7	193.4	188.6	183.0	175.8	169.4	162.1
75°	269.7	272.9	276.1	273.7	271.3	268.1	264.9	259.3	252.0	244.0	235.2
72.5°	370.8	375.6	379.7	374.8	371.6	366.0	360.4	353.2	345.1	333.9	321.9
70°	502.5	508.1	512.9	505.7	499.3	492.0	484.0	476.0	466.3	452.7	436.6
67.5°	667.8	675.8	682.3	670.2	661.4	649.4	637.3	626.1	612.4	594.8	575.5
65°	836.4	839.6	836.4	832.4	825.1	813.9	803.5	792.2	776.2	754.5	728.8
62.5°	1035.4	1040.2	1036.2	1033.0	1025.0	1011.4	1000.1	987.3	966.4	936.7	908.6
60°	1301.1	1308.3	1302.7	1297.1	1284.3	1264.2	1250.5	1232.9	1205.6	1167.9	1131.8
57.5°	1626.2	1636.6	1631.0	1627.0	1611.7	1585.3	1574.0	1547.5	1501.0	1451.2	1407.9
55°	2115.0	2139.1	2139.1	2141.5	2123.0	2084.5	2073.3	2020.3	1920.8	1871.0	1810.8
52.5°	3025.2	3065.4	3058.1	3052.5	3008.4	2943.4	2906.4	2810.1	2668.0	2607.0	2476.2
50°	4261.3	4310.3	4295.0	4285.4	4222.8	4140.9	4072.7	3957.1	3819.1	3690.6	3477.9
47.5°	5685.2	5739.8	5721.4	5708.5	5633.9	5544.8	5432.4	5249.4	5118.6	4996.6	4756.6
45°	7142.1	7182.2	7158.9	7146.9	7071.4	7005.6	6906.1	6797.7	6598.7	6438.9	6208.6
42.5°	8460.8	8484.9	8469.7	8467.3	8404.7	8379.0	8303.5	8144.6	8065.1	7922.3	7687.1
40°	9622.3	9624.7	9619.1	9628.7	9591.8	9603.8	9560.5	9468.2	9406.4	9302.8	9046.8
37.5°	10595.9	10575.8	10590.3	10617.6	10627.2	10666.5	10655.3	10625.6	10594.3	10496.4	10261.2
35°	11389.7	11363.3	11408.2	11457.2	11515.0	11582.4	11587.2	11630.5	11633.8	11534.2	11336.0
32.5°	12080.0	12039.9	12114.5	12182.0	12289.5	12381.0	12441.2	12505.4	12560.8	12434.8	12279.1
30°	12714.9	12658.8	12758.3	12834.5	12983.0	13093.8	13195.7	13274.4	13295.3	13229.4	13086.6
27.5°	13287.2	13207.8	13332.2	13438.1	13610.7	13746.4	13861.1	13959.1	13971.9	13939.0	13800.9
25°	13822.6	13750.4	13875.6	14011.2	14186.2	14332.3	14451.1	14545.8	14581.1	14559.4	14353.2
22.5°	14352.4	14274.5	14396.5	14553.8	14723.2	14863.7	14980.0	15074.0	15133.4	15040.2	14837.2
20°	14854.8	14758.5	14878.9	15045.9	15202.4	15330.8	15463.2	15558.8	15568.4	15451.2	15265.8
17.5°	15310.7	15219.2	15330.0	15475.3	15623.0	15745.0	15897.5	15976.1	15928.0	15818.0	15628.6
15°	15727.3	15633.4	15730.5	15841.3	15952.1	16126.2	16267.5	16306.0	16275.5	16156.7	15957.7
12.5°	16093.3	15991.4	16077.3	16160.0	16302.8	16474.6	16571.7	16614.3	16594.2	16481.8	16278.7
10°	16401.6	16301.2	16379.1	16475.4	16655.2	16779.6	16884.8	16955.4	16926.5	16821.3	16616.7
7.5°	16644.8	16558.1	16627.9	16802.1	16945.0	17088.6	17209.8	17287.7	17286.9	17177.7	16951.4
5°	16845.4	16758.7	16882.3	17009.2	17200.2	17396.9	17557.4	17654.5	17610.4	17441.0	17154.4
2.5°	16991.5	16900.8	16978.7	17203.4	17457.9	17631.2	17760.5	17827.1	17784.5	17610.4	17314.2
0°	16918.5	17088.6	17179.3	17368.0	17611.2	17814.2	17965.1	18032.6	17988.4	17811.0	17500.4



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 CATALOG NUMBER: NHRS100UBZ740-75%

CANDELA DISTRIBUTION (continued):

	27.5°	30°	32.5°	35°	37.5°	40°	42.5°	45°	47.5°	50°	52.5°
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	4.0	4.0	4.0	3.2	4.0	4.0	4.0	4.0	3.2	3.2	3.2
82.5°	24.9	24.1	23.3	21.7	20.1	18.5	16.1	13.6	11.2	11.2	11.2
80°	81.9	75.5	69.0	62.6	55.4	49.0	44.1	41.7	38.5	35.3	32.1
77.5°	154.1	145.3	135.6	125.2	113.2	101.9	90.7	81.1	73.8	66.6	58.6
75°	226.4	215.1	201.5	188.6	175.8	161.3	145.3	130.0	116.4	105.1	94.7
72.5°	309.0	294.6	280.9	266.5	249.6	230.4	208.7	190.2	175.8	158.9	138.9
70°	419.0	401.3	383.7	363.6	340.3	313.8	288.2	266.5	244.0	219.1	196.7
67.5°	553.0	530.6	504.9	479.2	449.5	420.6	388.5	355.6	320.3	291.4	262.5
65°	703.1	674.2	642.1	610.8	577.9	541.8	501.7	459.1	419.8	376.4	335.5
62.5°	878.9	841.2	797.0	756.9	718.4	674.2	631.7	577.1	525.7	472.8	421.4
60°	1088.4	1037.8	984.9	928.7	874.1	816.3	760.9	700.7	638.9	578.7	512.9
57.5°	1347.7	1269.8	1199.2	1128.5	1047.5	976.8	907.8	831.6	761.7	687.1	611.6
55°	1706.5	1578.8	1490.5	1376.6	1262.6	1168.7	1065.1	982.5	891.0	803.5	712.8
52.5°	2261.1	2101.4	1927.2	1720.1	1566.0	1404.7	1277.0	1153.4	1039.4	927.9	820.3
50°	3212.2	2938.5	2582.2	2293.2	2003.4	1745.8	1551.5	1361.3	1215.2	1065.1	935.9
47.5°	4449.1	4052.6	3586.3	3143.2	2662.4	2284.4	1897.5	1660.7	1411.1	1228.1	1062.7
45°	5853.8	5378.6	4853.7	4226.0	3600.7	2973.1	2491.5	2004.2	1698.4	1411.1	1206.4
42.5°	7299.4	6826.6	6227.8	5509.5	4696.4	3918.6	3194.6	2588.6	2012.3	1663.9	1375.0
40°	8684.8	8200.8	7634.1	6802.5	5944.5	4977.3	4091.2	3213.9	2530.8	1955.3	1568.4
37.5°	9943.4	9480.2	8859.8	8040.2	7104.3	6138.7	5026.3	4009.3	3099.1	2362.2	1834.9
35°	11033.4	10646.5	9950.6	9169.6	8245.7	7174.2	5985.4	4819.2	3769.3	2847.0	2103.0
32.5°	12006.2	11550.3	10937.8	10167.3	9286.0	8151.8	6910.1	5670.8	4465.2	3349.5	2469.0
30°	12821.7	12341.7	11769.4	11082.3	10117.5	9008.3	7780.2	6474.3	5173.9	3907.3	2836.6
27.5°	13472.6	13053.7	12499.8	11767.8	10856.8	9786.8	8549.9	7218.3	5792.0	4412.2	3197.0
25°	14040.9	13652.4	13109.8	12373.0	11473.2	10429.8	9242.6	7821.1	6350.6	4915.5	3624.0
22.5°	14545.8	14145.3	13582.6	12886.7	12043.1	11001.3	9757.1	8336.4	6852.3	5379.4	4001.3
20°	14968.8	14548.2	14050.6	13351.4	12495.0	11425.1	10185.8	8788.3	7289.0	5784.0	4331.2
17.5°	15344.5	14926.3	14394.1	13703.0	12850.6	11813.5	10578.3	9237.8	7658.2	6129.9	4658.6
15°	15670.3	15265.0	14716.8	14022.5	13175.7	12143.4	10902.5	9480.2	7956.8	6418.1	4934.0
12.5°	16002.6	15573.2	15004.1	14291.4	13423.7	12381.0	11133.7	9713.0	8191.1	6644.4	5149.1
10°	16302.0	15852.5	15258.6	14505.7	13601.9	12538.4	11299.8	9884.0	8361.3	6809.8	5306.4
7.5°	16582.2	16074.1	15424.7	14644.5	13726.3	12648.3	11409.8	9990.7	8466.5	6914.9	5407.5
5°	16756.3	16234.6	15552.3	14744.1	13804.9	12706.1	11459.6	10034.1	8529.9	6995.2	5491.0
2.5°	16902.4	16398.3	15692.8	14871.7	13927.8	12828.9	11595.2	10176.9	8655.9	7100.3	5574.5
0°	17074.2	16517.9	15795.5	14952.8	13983.1	12867.4	11620.1	10188.2	8659.1	7094.7	5564.0



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 CATALOG NUMBER: NHRS100UBZ740-75%

CANDELA DISTRIBUTION (continued):

	55°	57.5°	60°	62.5°	65°	67.5°	70°	72.5°	75°	77.5°	80°
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	2.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8
82.5°	10.4	9.6	8.0	6.4	4.8	3.2	0.8	0.8	0.8	0.8	0.8
80°	27.3	21.7	16.9	14.4	12.8	10.4	8.0	4.8	1.6	0.8	0.8
77.5°	52.2	45.8	38.5	30.5	23.3	18.5	15.3	11.2	7.2	2.4	0.8
75°	84.3	73.0	61.8	51.4	42.5	33.7	23.3	18.5	13.6	8.0	1.6
72.5°	120.4	106.8	92.3	76.3	61.0	51.4	40.1	27.3	19.3	12.8	5.6
70°	173.4	148.5	124.4	106.8	88.3	69.0	56.2	42.5	25.7	17.7	9.6
67.5°	230.4	200.7	171.0	140.5	118.0	96.3	73.0	57.0	38.5	21.7	13.6
65°	296.2	257.7	219.1	185.4	150.1	122.8	97.1	72.2	51.4	29.7	16.9
62.5°	366.8	320.3	275.3	229.6	190.2	151.7	121.2	91.5	64.2	40.1	20.9
60°	450.3	390.1	334.7	281.7	230.4	187.0	145.3	112.4	77.9	50.6	24.9
57.5°	536.2	465.5	398.9	334.7	274.5	221.5	174.2	133.2	93.1	61.0	32.1
55°	626.1	542.6	466.3	389.3	320.3	256.9	204.7	154.9	109.2	70.6	40.1
52.5°	718.4	624.5	533.8	448.7	369.2	296.2	233.6	175.8	125.2	81.1	48.2
50°	817.1	705.5	605.2	507.3	416.6	333.9	263.3	199.1	140.5	93.1	55.4
47.5°	919.8	795.4	673.4	567.5	468.0	370.8	295.4	221.5	155.7	105.1	62.6
45°	1035.4	880.5	748.1	627.7	518.5	415.0	324.3	242.4	173.4	116.4	69.0
42.5°	1149.4	979.2	822.7	690.3	569.1	459.1	352.4	264.9	190.2	127.6	76.3
40°	1299.5	1077.2	895.0	748.1	618.0	500.9	382.1	288.2	206.3	138.1	83.5
37.5°	1442.4	1179.9	980.9	810.7	663.8	538.6	415.8	309.8	221.5	147.7	91.5
35°	1629.4	1305.9	1062.7	869.3	710.4	576.3	447.1	330.7	235.2	158.1	98.7
32.5°	1845.3	1425.5	1146.2	934.3	760.9	612.4	476.8	350.8	249.6	169.4	105.1
30°	2047.6	1559.6	1240.9	1000.1	807.5	646.9	504.9	370.0	264.9	179.0	111.6
27.5°	2324.5	1732.9	1336.4	1061.1	850.8	679.1	531.4	392.5	279.3	188.6	117.2
25°	2603.0	1891.9	1423.9	1118.1	891.0	712.8	557.0	412.6	292.2	196.7	122.8
22.5°	2847.0	2031.5	1503.4	1179.1	937.5	744.9	580.3	431.0	304.2	204.7	127.6
20°	3083.0	2199.3	1619.0	1244.1	979.2	774.6	602.0	447.9	314.6	211.1	131.6
17.5°	3360.7	2375.9	1718.5	1301.1	1016.2	800.3	621.3	462.3	324.3	217.5	135.6
15°	3594.3	2528.4	1802.8	1350.1	1048.3	822.7	638.1	474.4	332.3	222.3	138.9
12.5°	3785.3	2655.2	1872.6	1391.8	1075.6	842.0	652.6	484.8	338.7	226.4	141.3
10°	3933.0	2757.1	1927.2	1425.5	1097.2	855.6	663.8	492.8	344.3	230.4	143.7
7.5°	4039.0	2831.0	1964.9	1447.2	1110.9	865.3	671.8	498.5	348.4	232.8	147.7
5°	4101.6	2867.9	1985.8	1460.0	1120.5	878.9	683.1	506.5	353.2	236.0	147.7
2.5°	4144.1	2891.2	1999.4	1468.9	1126.9	876.5	682.3	504.9	352.4	236.0	146.9
0°	4109.6	2864.7	1985.8	1462.4	1122.9	874.1	680.7	503.3	351.6	235.2	146.9



REPORT NUMBER: P855620
 CATALOG NUMBER: NHRS100UBZ740-75%

CANDELA DISTRIBUTION (continued):

	82.5°	85°	87.5°	90°
90°	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0
82.5°	0.8	0.8	0.0	0.0
80°	0.8	0.8	0.0	0.0
77.5°	0.8	0.8	0.0	0.0
75°	0.8	0.8	0.8	0.0
72.5°	1.6	0.8	0.8	0.0
70°	1.6	0.8	0.8	0.0
67.5°	4.8	1.6	0.8	0.0
65°	8.0	1.6	0.8	0.0
62.5°	10.4	1.6	0.8	0.0
60°	12.8	1.6	0.8	0.0
57.5°	16.1	3.2	0.8	0.0
55°	18.5	4.8	0.8	0.0
52.5°	20.9	6.4	0.8	0.0
50°	23.3	8.0	0.8	0.0
47.5°	26.5	9.6	0.8	0.0
45°	31.3	11.2	0.8	0.0
42.5°	36.1	12.8	0.8	0.0
40°	40.9	14.4	1.6	0.0
37.5°	45.8	15.3	1.6	0.0
35°	49.8	16.9	1.6	0.0
32.5°	53.8	17.7	1.6	0.0
30°	57.8	19.3	1.6	0.0
27.5°	61.0	20.1	1.6	0.0
25°	64.2	20.9	1.6	0.0
22.5°	67.4	21.7	1.6	0.0
20°	69.8	22.5	1.6	0.0
17.5°	72.2	23.3	1.6	0.0
15°	74.6	24.1	1.6	0.0
12.5°	76.3	24.1	1.6	0.0
10°	77.9	25.7	1.6	0.0
7.5°	80.3	25.7	1.6	0.0
5°	80.3	25.7	1.6	0.0
2.5°	80.3	25.7	1.6	0.0
0°	80.3	25.7	1.6	0.0

Signify Classified - Internal
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

LUMARK

Report Number: SP1-2401-297-1

Test Date: 02/27/2024

Luminaire Tested: NHRS100U33BZ740

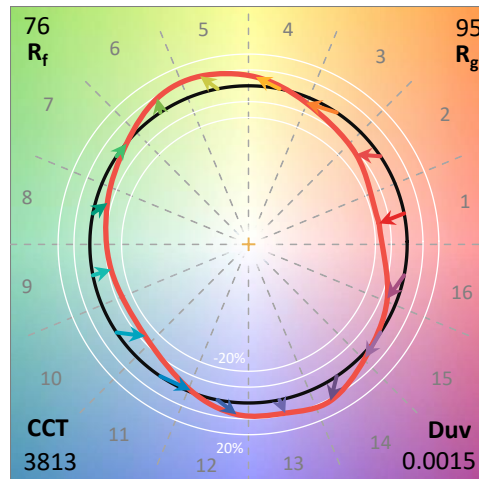
Data in this report applies to families of products NHRS100U33BZ740.

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2401-297-1
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 02/29/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: LUMARK
 Catalog Number: **NHRS100U33BZ740**
 Description: LUMARK NIGHT HARRIER 4 PANEL FLOOD SELECTABLE CCT NEMA 3 AT 4000K.

Spectral Parameters

CCT (K):	3813	CRI (Ra):	73.3	R9:	-31.2
CIE u':	0.2279	R1:	69.8	R10:	54.5
CIE v':	0.5070	R2:	80.2	R11:	69.7
Duv:	0.0015	R3:	89.7	R12:	50.7
CIE x:	0.3902	R4:	72.6	R13:	71.5
CIE y:	0.3858	R5:	70.3	R14:	94.2
CIE z:	0.2240	R6:	73.1		
Peak Wavelength (nm):	588	R7:	80.3		
Dominant Wavelength (nm):	579	R8:	50.5		
Purity:	33				
Rf:	76				
Rg:	94.9				



Test Conditions

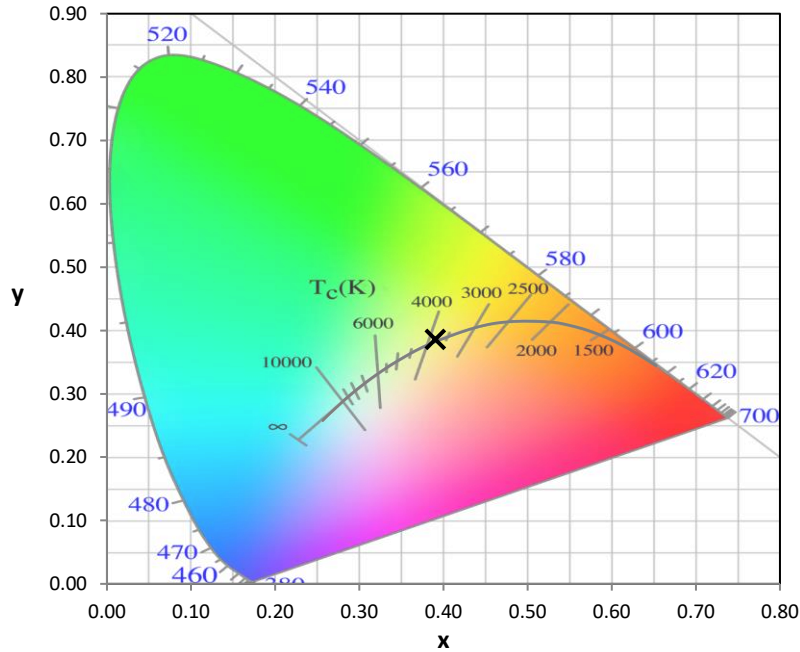
Stabilization Time: 27M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.9/30%
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2401-297-1

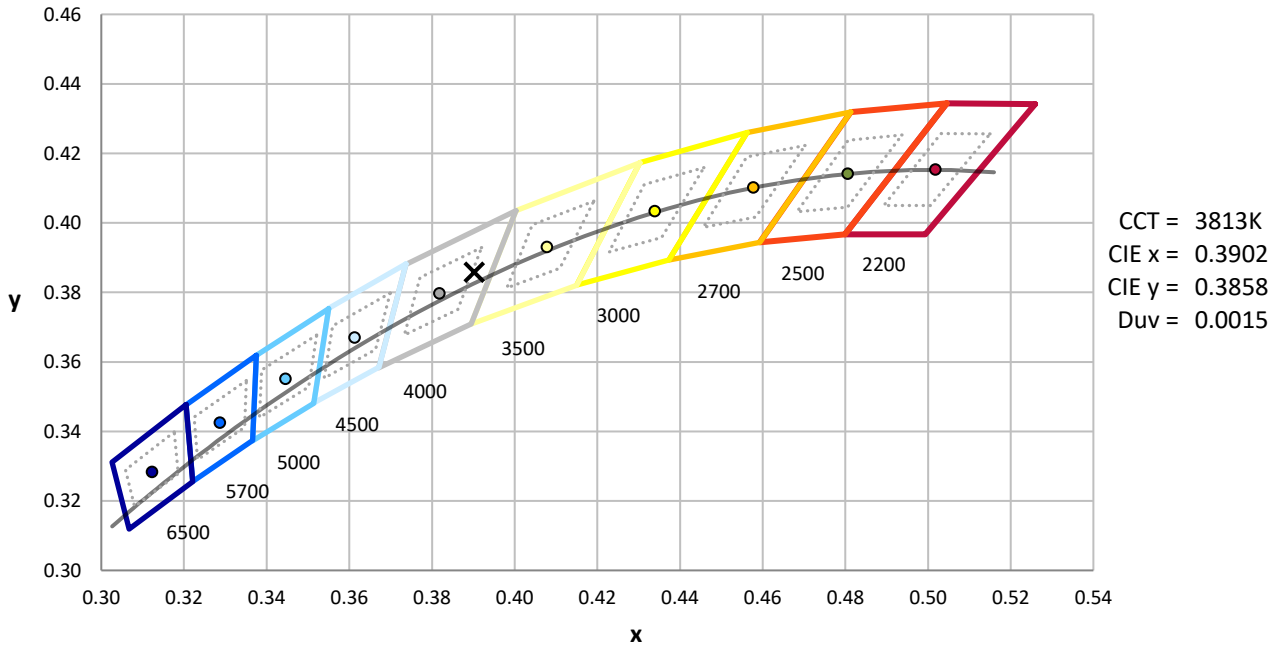
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	2/12/2024	8/12/2024
Power Meter	XITRON 2801 IN0071	10/23/2023	10/23/2024
AC Power Source	CHROMA 61603 IN0063	10/24/2023	10/24/2024
DC Power Source	AGILENT E3634A IN0208	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

REPORT NUMBER: SP1-2401-297-1

CIE 1931 Chromaticity Diagram



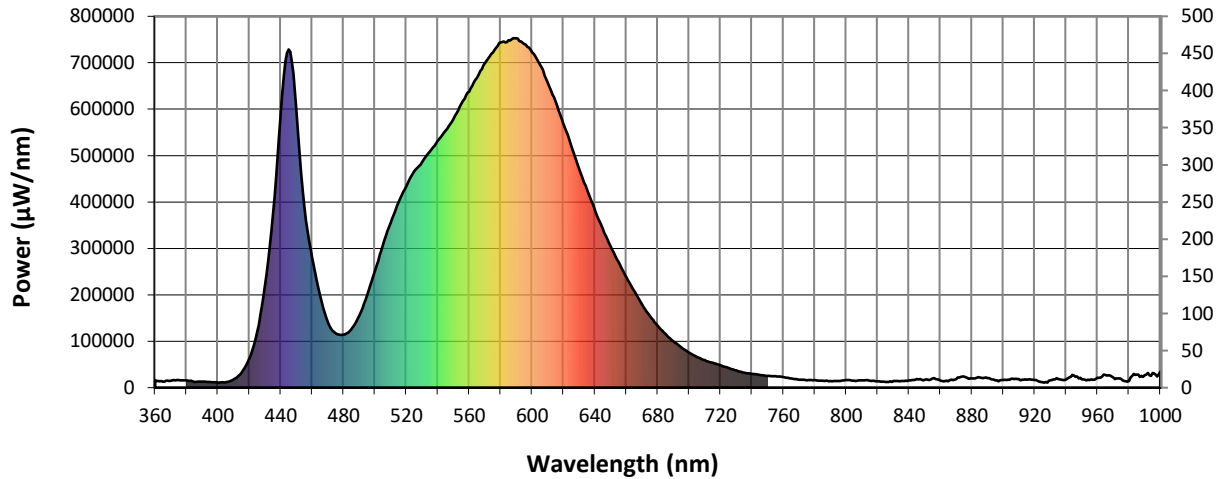
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 7-step quadrangle

REPORT NUMBER: SP1-2401-297-1

Photopic Flux vs. Wavelength

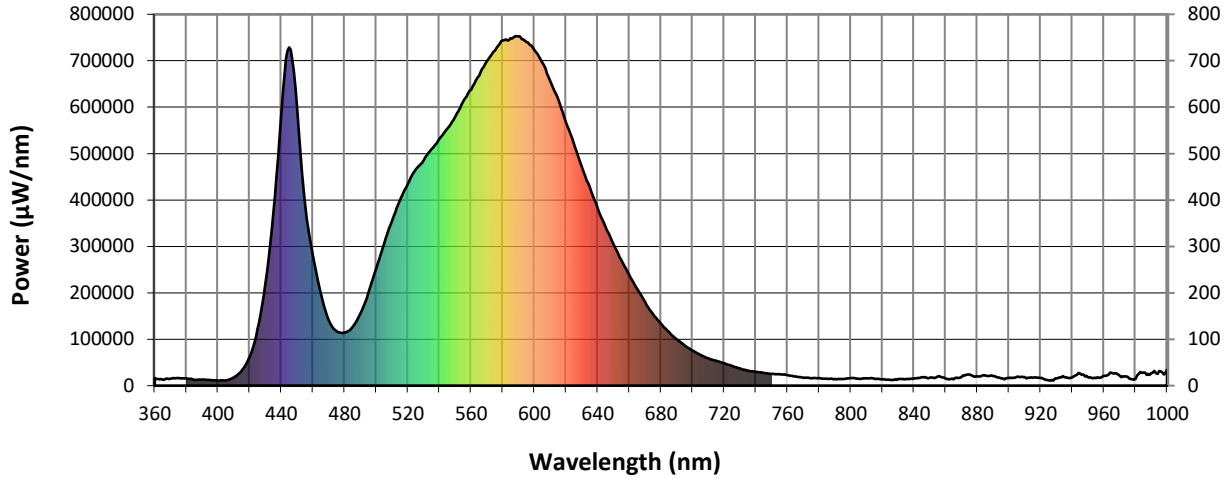


#####

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	16398	NR	490	155831	NR	620	567337	NR	750	25466	NR	880	19771	NR
365	13123	NR	495	198729	NR	625	521140	NR	755	24338	NR	885	21957	NR
370	15030	NR	500	251965	NR	630	470991	NR	760	22599	NR	890	20614	NR
375	16296	NR	505	306076	NR	635	427056	NR	765	19563	NR	895	15375	NR
380	15892	NR	510	355577	NR	640	382818	NR	770	17426	NR	900	16296	NR
385	12549	NR	515	398863	NR	645	341624	NR	775	15796	NR	905	19143	NR
390	13152	NR	520	434390	NR	650	304460	NR	780	16330	NR	910	18237	NR
395	12229	NR	525	466051	NR	655	270804	NR	785	14950	NR	915	16975	NR
400	11150	NR	530	485671	NR	660	238277	NR	790	14005	NR	920	16312	NR
405	11879	NR	535	509383	NR	665	208122	NR	795	14564	NR	925	11706	NR
410	17721	NR	540	532274	NR	670	179696	NR	800	16137	NR	930	15527	NR
415	32111	NR	545	554089	NR	675	154108	NR	805	15075	NR	935	18490	NR
420	62390	NR	550	578776	NR	680	133705	NR	810	15555	NR	940	17773	NR
425	121268	NR	555	612107	NR	685	115536	NR	815	14754	NR	945	25841	NR
430	220726	NR	560	637686	NR	690	100064	NR	820	13505	NR	950	17761	NR
435	373394	NR	565	667836	NR	695	86382	NR	825	12293	NR	955	16631	NR
440	589358	NR	570	698666	NR	700	75497	NR	830	14300	NR	960	21142	NR
445	728428	NR	575	721902	NR	705	66081	NR	835	14618	NR	965	27511	NR
450	598034	NR	580	743873	NR	710	59114	NR	840	15969	NR	970	21965	NR
455	389717	NR	585	748604	NR	715	53479	NR	845	18265	NR	975	18878	NR
460	281154	NR	590	752716	NR	720	48297	NR	850	17384	NR	980	14363	NR
465	199045	NR	595	740315	NR	725	42936	NR	855	19899	NR	985	28317	NR
470	140668	NR	600	722442	NR	730	36922	NR	860	15220	NR	990	26698	NR
475	117056	NR	605	696058	NR	735	32349	NR	865	13399	NR	995	31324	NR
480	114360	NR	610	656414	NR	740	29457	NR	870	18340	NR	1000	34167	NR
485	125911	NR	615	616792	NR	745	27577	NR	875	23987	NR			

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Scotopic Flux vs. Wavelength



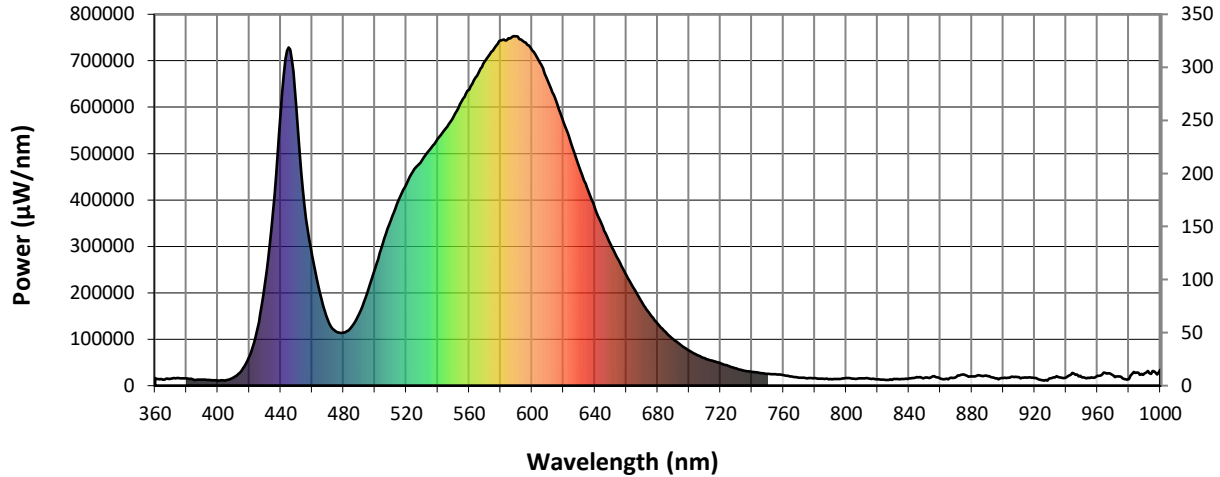
Scotopic Lumens: 60654

S/P: 1.49

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	16398	NR	490	155831	NR	620	567337	NR	750	25466	NR	880	19771	NR
365	13123	NR	495	198729	NR	625	521140	NR	755	24338	NR	885	21957	NR
370	15030	NR	500	251965	NR	630	470991	NR	760	22599	NR	890	20614	NR
375	16296	NR	505	306076	NR	635	427056	NR	765	19563	NR	895	15375	NR
380	15892	NR	510	355577	NR	640	382818	NR	770	17426	NR	900	16296	NR
385	12549	NR	515	398863	NR	645	341624	NR	775	15796	NR	905	19143	NR
390	13152	NR	520	434390	NR	650	304460	NR	780	16330	NR	910	18237	NR
395	12229	NR	525	466051	NR	655	270804	NR	785	14950	NR	915	16975	NR
400	11150	NR	530	485671	NR	660	238277	NR	790	14005	NR	920	16312	NR
405	11879	NR	535	509383	NR	665	208122	NR	795	14564	NR	925	11706	NR
410	17721	NR	540	532274	NR	670	179696	NR	800	16137	NR	930	15527	NR
415	32111	NR	545	554089	NR	675	154108	NR	805	15075	NR	935	18490	NR
420	62390	NR	550	578776	NR	680	133705	NR	810	15555	NR	940	17773	NR
425	121268	NR	555	612107	NR	685	115536	NR	815	14754	NR	945	25841	NR
430	220726	NR	560	637686	NR	690	100064	NR	820	13505	NR	950	17761	NR
435	373394	NR	565	667836	NR	695	86382	NR	825	12293	NR	955	16631	NR
440	589358	NR	570	698666	NR	700	75497	NR	830	14300	NR	960	21142	NR
445	728428	NR	575	721902	NR	705	66081	NR	835	14618	NR	965	27511	NR
450	598034	NR	580	743873	NR	710	59114	NR	840	15969	NR	970	21965	NR
455	389717	NR	585	748604	NR	715	53479	NR	845	18265	NR	975	18878	NR
460	281154	NR	590	752716	NR	720	48297	NR	850	17384	NR	980	14363	NR
465	199045	NR	595	740315	NR	725	42936	NR	855	19899	NR	985	28317	NR
470	140668	NR	600	722442	NR	730	36922	NR	860	15220	NR	990	26698	NR
475	117056	NR	605	696058	NR	735	32349	NR	865	13399	NR	995	31324	NR
480	114360	NR	610	656414	NR	740	29457	NR	870	18340	NR	1000	34167	NR
485	125911	NR	615	616792	NR	745	27577	NR	875	23987	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 23183.7 M/P: 0.57

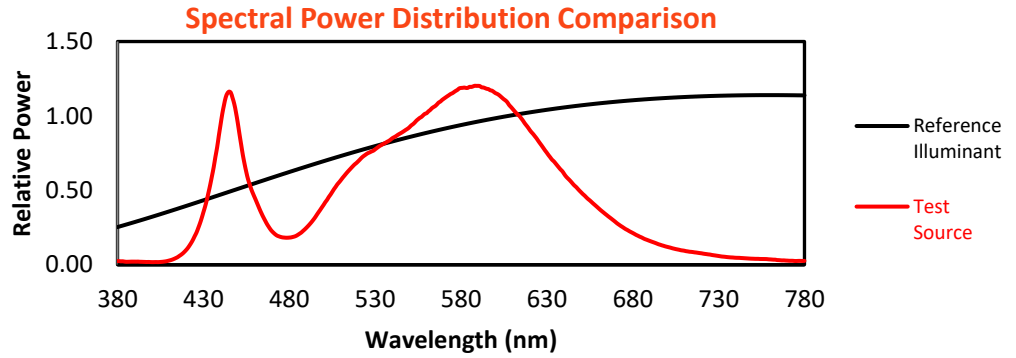
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	16398	NR	490	155831	NR	620	567337	NR	750	25466	NR	880	19771	NR
365	13123	NR	495	198729	NR	625	521140	NR	755	24338	NR	885	21957	NR
370	15030	NR	500	251965	NR	630	470991	NR	760	22599	NR	890	20614	NR
375	16296	NR	505	306076	NR	635	427056	NR	765	19563	NR	895	15375	NR
380	15892	NR	510	355577	NR	640	382818	NR	770	17426	NR	900	16296	NR
385	12549	NR	515	398863	NR	645	341624	NR	775	15796	NR	905	19143	NR
390	13152	NR	520	434390	NR	650	304460	NR	780	16330	NR	910	18237	NR
395	12229	NR	525	466051	NR	655	270804	NR	785	14950	NR	915	16975	NR
400	11150	NR	530	485671	NR	660	238277	NR	790	14005	NR	920	16312	NR
405	11879	NR	535	509383	NR	665	208122	NR	795	14564	NR	925	11706	NR
410	17721	NR	540	532274	NR	670	179696	NR	800	16137	NR	930	15527	NR
415	32111	NR	545	554089	NR	675	154108	NR	805	15075	NR	935	18490	NR
420	62390	NR	550	578776	NR	680	133705	NR	810	15555	NR	940	17773	NR
425	121268	NR	555	612107	NR	685	115536	NR	815	14754	NR	945	25841	NR
430	220726	NR	560	637686	NR	690	100064	NR	820	13505	NR	950	17761	NR
435	373394	NR	565	667836	NR	695	86382	NR	825	12293	NR	955	16631	NR
440	589358	NR	570	698666	NR	700	75497	NR	830	14300	NR	960	21142	NR
445	728428	NR	575	721902	NR	705	66081	NR	835	14618	NR	965	27511	NR
450	598034	NR	580	743873	NR	710	59114	NR	840	15969	NR	970	21965	NR
455	389717	NR	585	748604	NR	715	53479	NR	845	18265	NR	975	18878	NR
460	281154	NR	590	752716	NR	720	48297	NR	850	17384	NR	980	14363	NR
465	199045	NR	595	740315	NR	725	42936	NR	855	19899	NR	985	28317	NR
470	140668	NR	600	722442	NR	730	36922	NR	860	15220	NR	990	26698	NR
475	117056	NR	605	696058	NR	735	32349	NR	865	13399	NR	995	31324	NR
480	114360	NR	610	656414	NR	740	29457	NR	870	18340	NR	1000	34167	NR
485	125911	NR	615	616792	NR	745	27577	NR	875	23987	NR			

REPORT NUMBER: SP1-2401-297-1

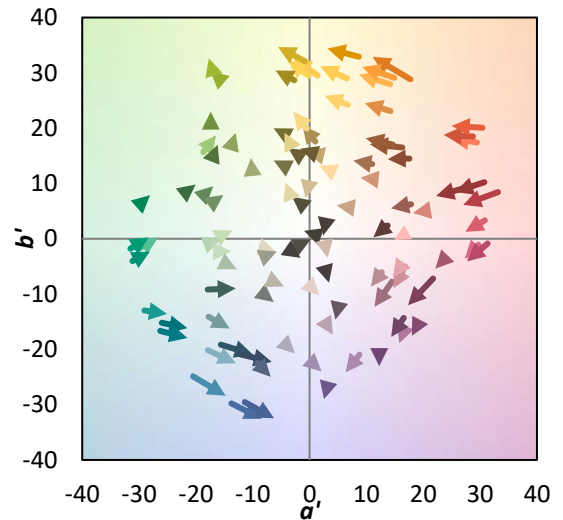
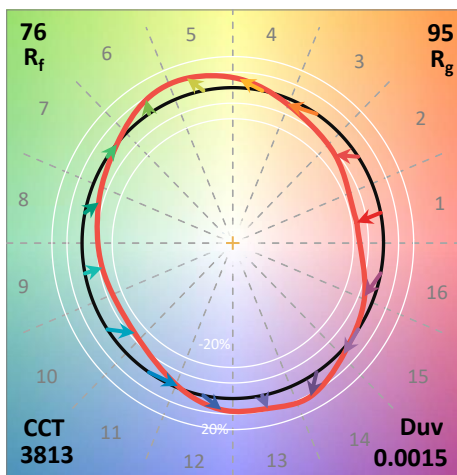
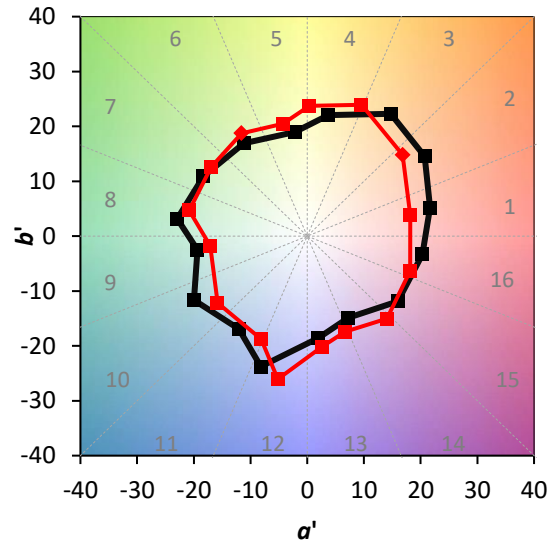
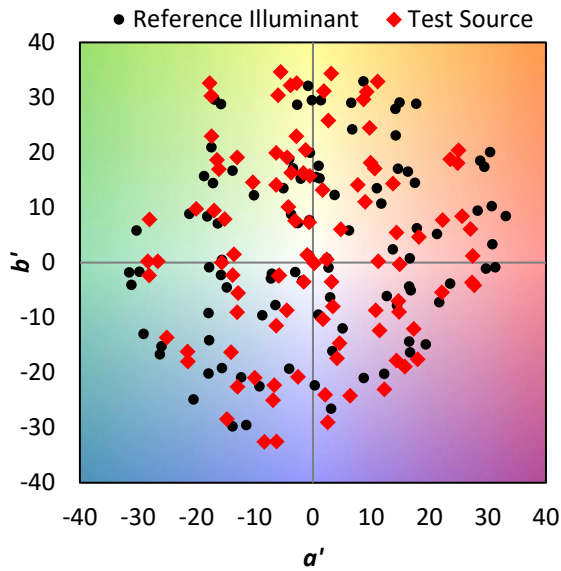
TM-30-18

Summary

$R_f = 76$
 $R_g = 94.9$
CIE $R_a = 73.3$
 $R_9 = -31.2$



Color Vector Graphics

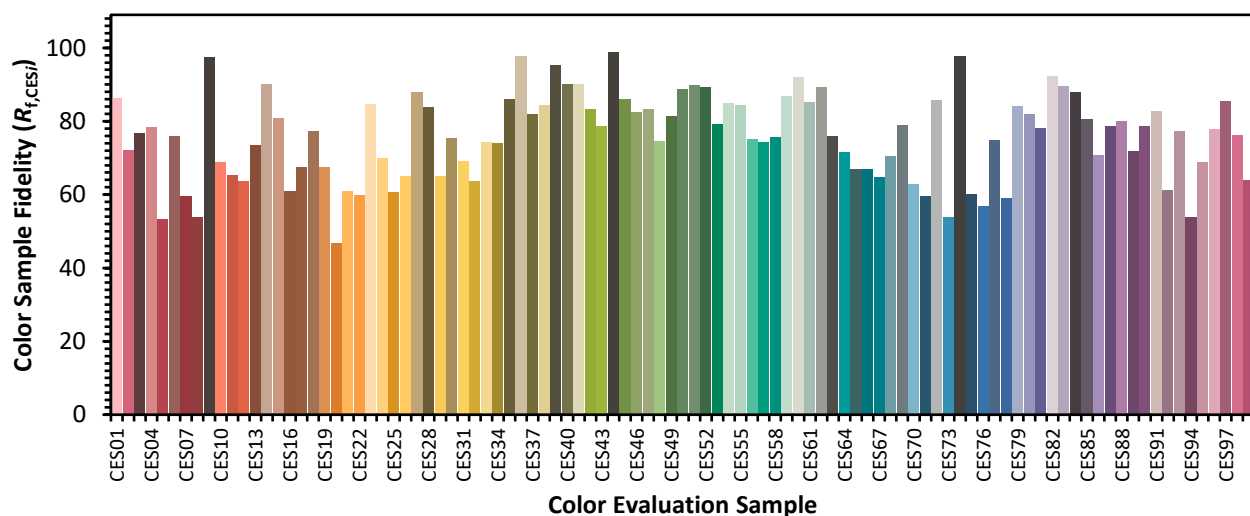


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Individual Sample Fidelity Index ($R_{f,i}$)

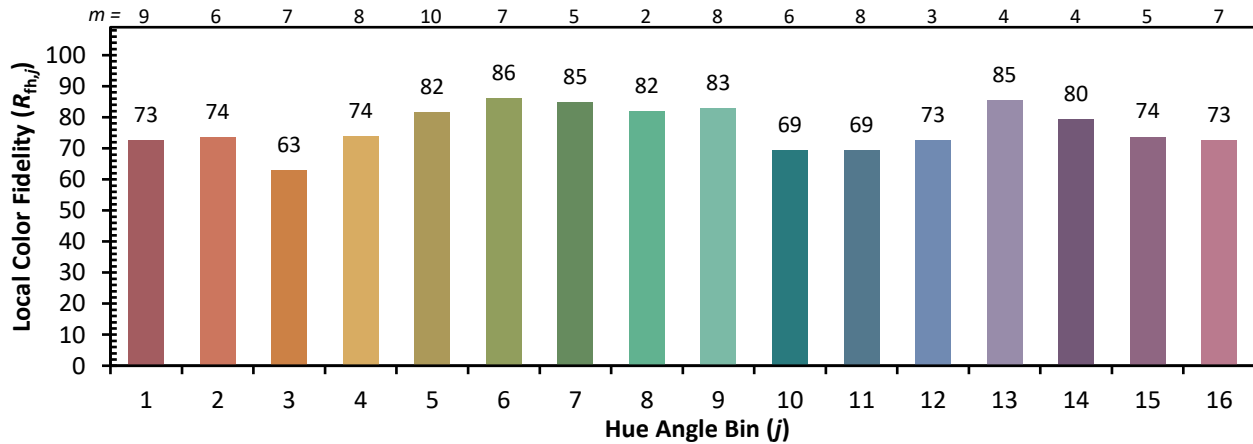
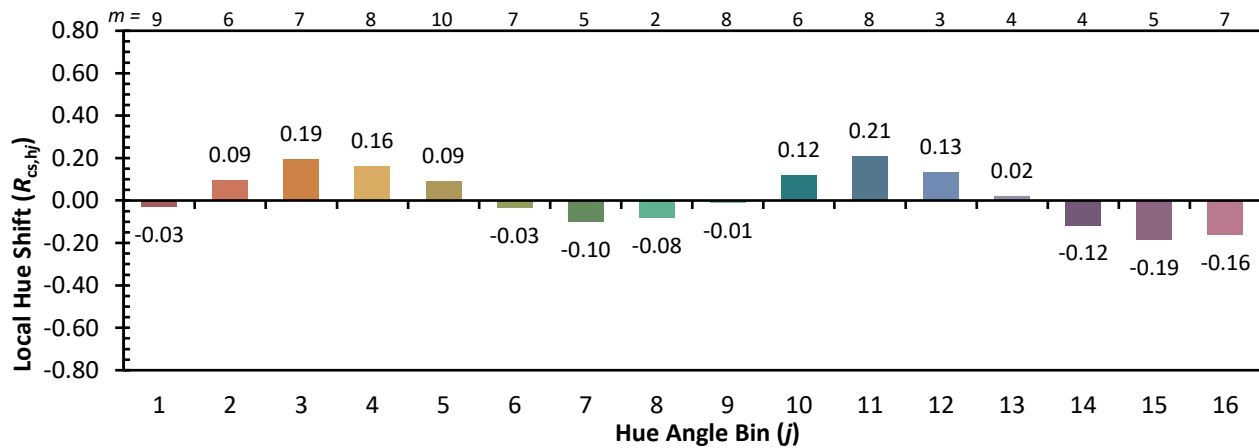
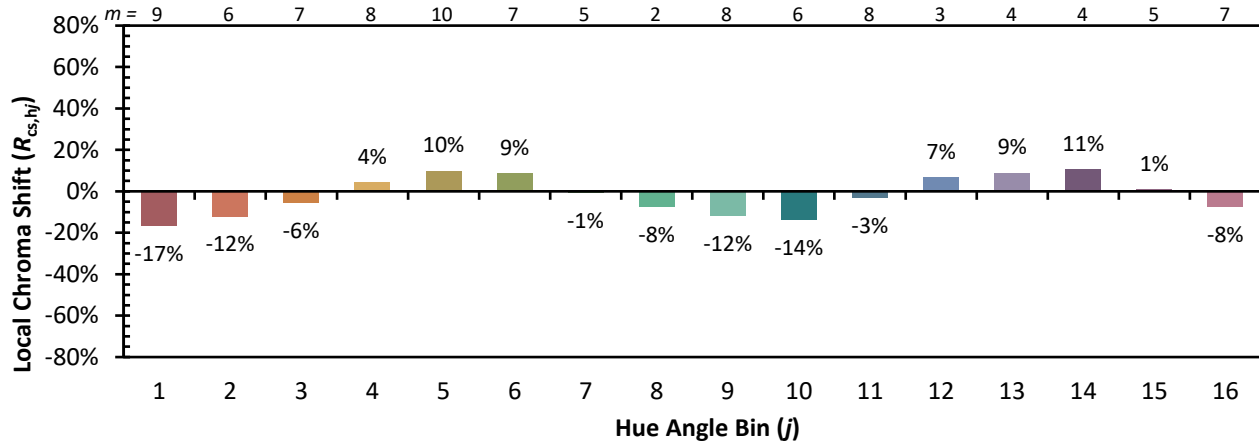
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CES02 = 61	CES27 = 88	CES52 = 89	CES77 = 75
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CES04 = 70	CES29 = 65	CES54 = 85	CES79 = 84
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CES06 = 51	CES31 = 69	CES56 = 75	CES81 = 78
CES07 = 40	CES32 = 64	CES57 = 74	CES82 = 92
CES08 = 39	CES33 = 74	CES58 = 76	CES83 = 90
CES09 = 29	CES34 = 74	CES59 = 87	CES84 = 88
CES10 = 74	CES35 = 86	CES60 = 92	CES85 = 81
CES11 = 57	CES36 = 98	CES61 = 85	CES86 = 71
CES12 = 63	CES37 = 82	CES62 = 89	CES87 = 79
CES13 = 42	CES38 = 84	CES63 = 76	CES88 = 80
CES14 = 74	CES39 = 95	CES64 = 72	CES89 = 72
CES15 = 71	CES40 = 90	CES65 = 67	CES90 = 79
CES16 = 46	CES41 = 90	CES66 = 67	CES91 = 83
CES17 = 49	CES42 = 83	CES67 = 65	CES92 = 61
CES18 = 56	CES43 = 79	CES68 = 70	CES93 = 77
CES19 = 72	CES44 = 99	CES69 = 79	CES94 = 54
CES20 = 65	CES45 = 86	CES70 = 63	CES95 = 69
CES21 = 86	CES46 = 83	CES71 = 59	CES96 = 78
CES22 = 78	CES47 = 83	CES72 = 86	CES97 = 85
CES23 = 92	CES48 = 75	CES73 = 54	CES98 = 76
CES24 = 91	CES49 = 81	CES74 = 98	CES99 = 64
CES25 = 72	CES50 = 89	CES75 = 60	



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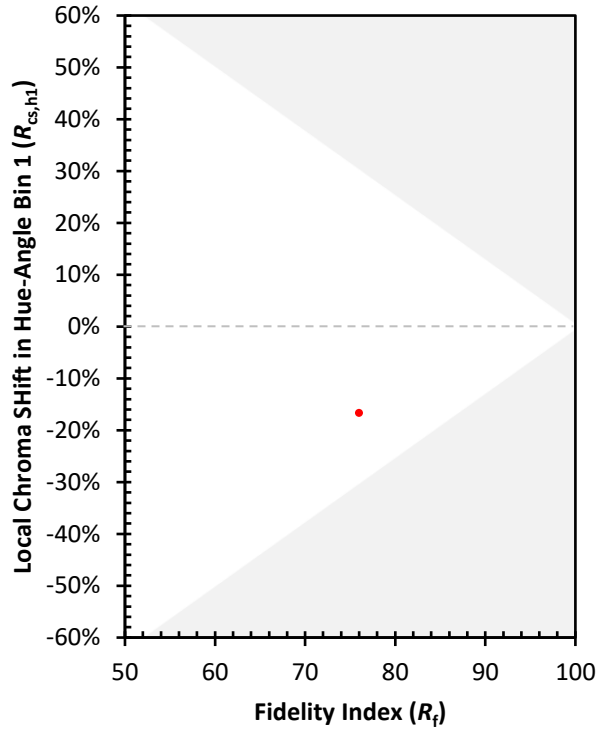
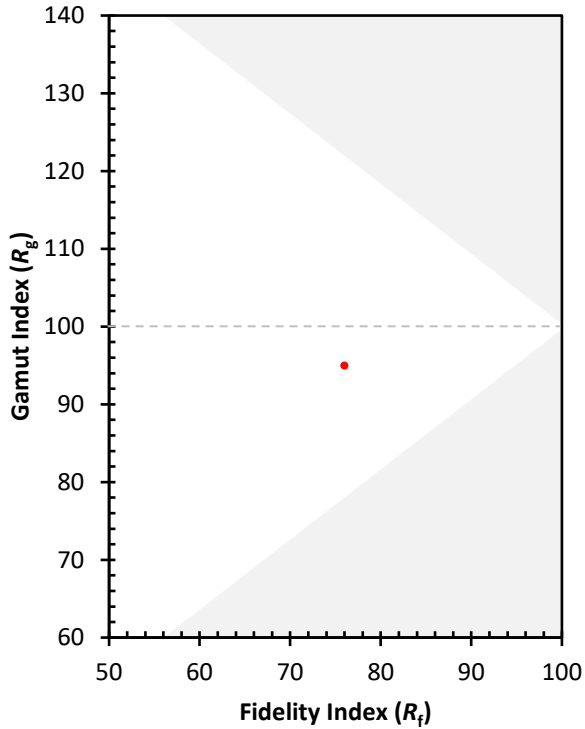
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)