

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: P855612

Luminaire Tested: **NHRS100U33BZ750-75%**

Issue Date: 07/17/2024

Test Information

Test Method: LM-79-2019
Report Number: P855612
Test Lab: INNOVATION CENTER(G2)
Issue Date: 07/17/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: LUMARK
Catalog Number: NHRS100U33BZ750-75%
Description: LUMARK NIGHT HARRIER 4 PANEL FLOOD SELECTABLE CCT NEMA3 @5000K 75%
Output
Light Source: (128) 5000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

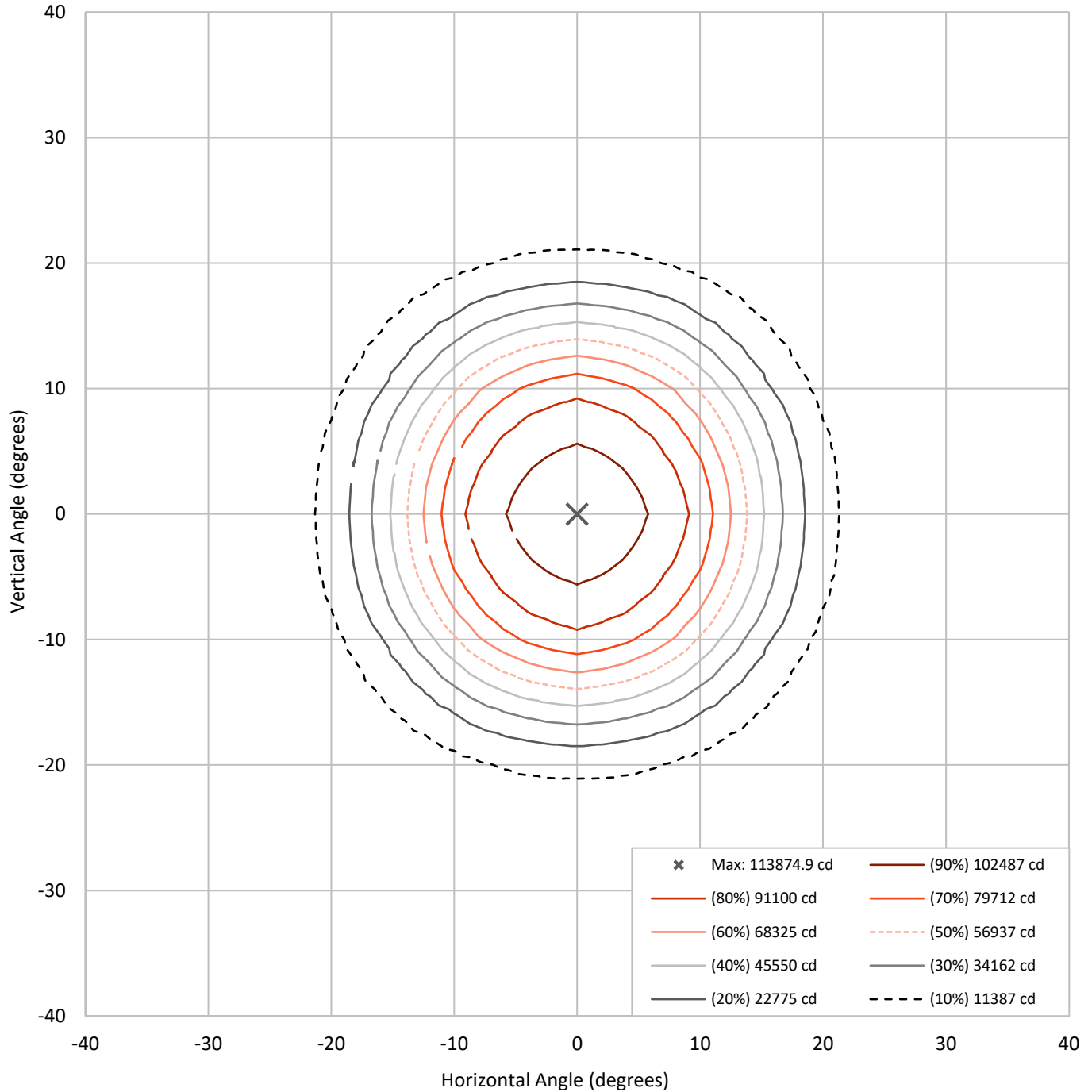
Lumens per Lamp:	N/A	NEMA Type:	3H x 3V
Luminaire Lumens:	30305.9 lumens	Max Intensity:	113874.9 candela
Efficiency:	N/A	Max Intensity Angle:	0°H x 0°V
Efficacy:	137.4 lumens/watt		
Luminous Opening:	Rectangular (W 1.29' x L: 1.12' x H: 0')		

Beam Angle (50%):	27.7°H x 27.9°V	Field Angle (10%):	42.6°H x 42.2°V
Beam Lumens:	11273.6 lumens	Field Lumens:	17027.2 lumens
Beam Efficiency:	37.2%	Field Efficiency:	56.2%

Input Watts (W): 220.5
Input Voltage (V): 120
Input Current (A_{in}): 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





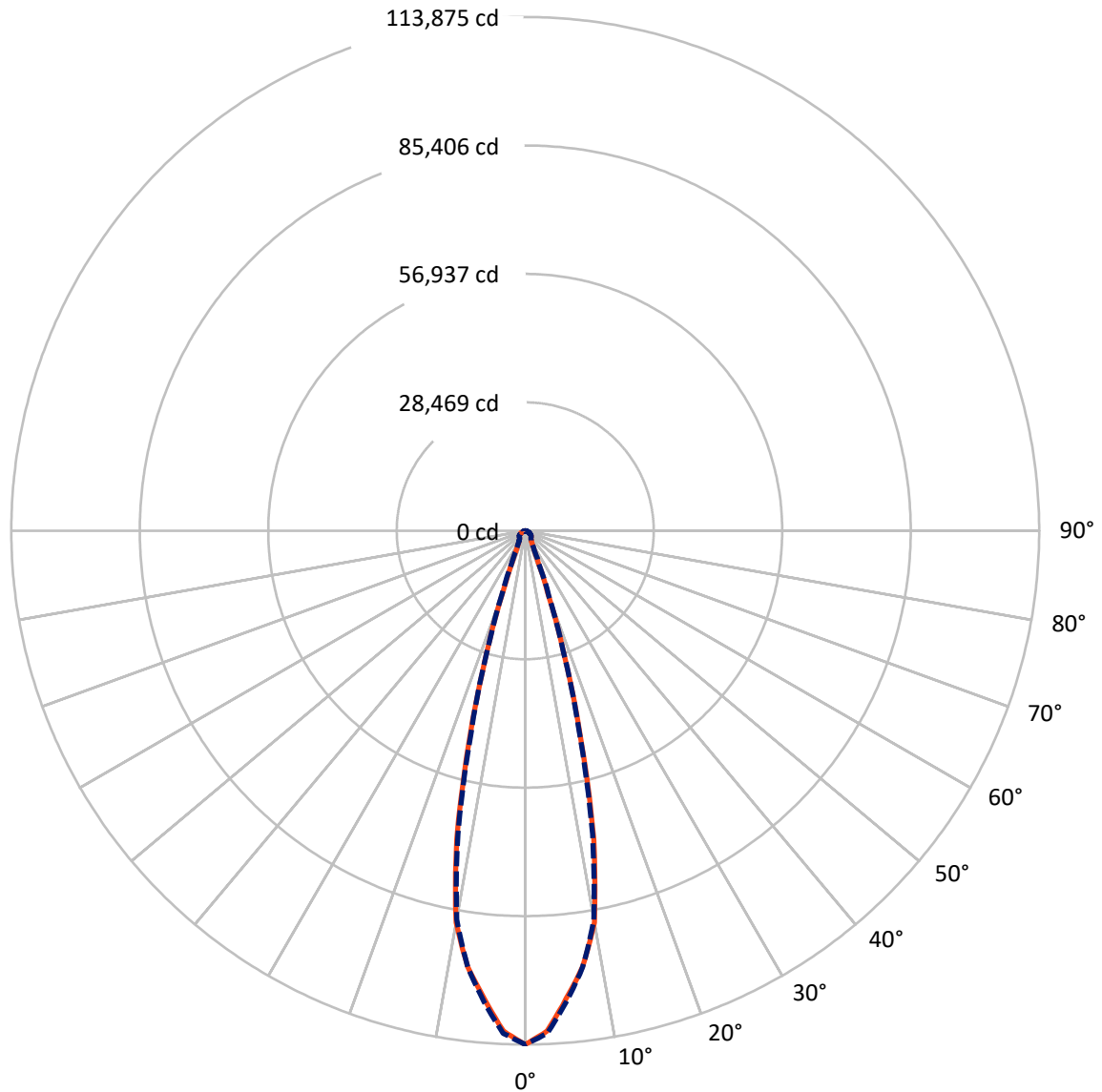
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Lumen Table

90	0.2		3.2		10.9		18.0		20.4		18.0		10.9		3.2		0.2		
80	0.2		3.2		10.9		18.0		20.4		18.0		10.9		3.2		0.2		
70	1.9	2.7	6.3	11.0	15.7	20.2	22.8	24.1	24.1	22.8	20.2	15.7	11.0	6.3	2.7	1.9			
60		5.0	11.3	18.8	26.7	34.1	39.3	42.3	42.3	39.3	34.1	26.7	18.8	11.3	5.0				
50	4.7	7.3	15.6	25.7	37.3	46.3	52.0	55.3	55.3	52.0	46.3	37.3	25.7	15.6	7.3	4.7			
40		9.1	18.9	31.8	44.0	52.5	60.6	67.6	67.6	60.6	52.5	44.0	31.8	18.9	9.1				
30	6.7	10.5	21.7	36.1	47.4	62.9	98.9	164.8	164.8	98.9	62.9	47.4	36.1	21.7	10.5	6.7			
20		11.3	23.9	38.4	51.5	93.7	437.7	1262.9	1262.9	437.7	93.7	51.5	38.4	23.9	11.3				
10	7.5	11.8	25.1	39.7	55.8	156.8	1226.0	2835.9	2835.9	1226.0	156.8	55.8	39.7	25.1	11.8	7.5			
0		11.8	25.1	39.7	55.8	156.8	1226.0	2835.9	2835.9	1226.0	156.8	55.8	39.7	25.1	11.8				
-10	6.7	11.3	23.9	38.4	51.5	93.7	437.7	1262.9	1262.9	437.7	93.7	51.5	38.4	23.9	11.3	6.7			
-20		10.5	21.7	36.1	47.4	62.9	98.9	164.8	164.8	98.9	62.9	47.4	36.1	21.7	10.5				
-30	4.7	9.1	18.9	31.8	44.0	52.5	60.6	67.6	67.6	60.6	52.5	44.0	31.8	18.9	9.1	4.7			
-40		7.3	15.6	25.7	37.3	46.3	52.0	55.3	55.3	52.0	46.3	37.3	25.7	15.6	7.3				
-50	1.9	5.0	11.3	18.8	26.7	34.1	39.3	42.3	42.3	39.3	34.1	26.7	18.8	11.3	5.0	1.9			
-60		2.7	6.3	11.0	15.7	20.2	22.8	24.1	24.1	22.8	20.2	15.7	11.0	6.3	2.7				
-70	0.2		3.2		10.9		18.0		20.4		18.0		10.9		3.2		0.2		
-80	0.2		3.2		10.9		18.0		20.4		18.0		10.9		3.2		0.2		
-90	0.2		3.2		10.9		18.0		20.4		18.0		10.9		3.2		0.2		
	-90	-80	-70	-60	-50	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90

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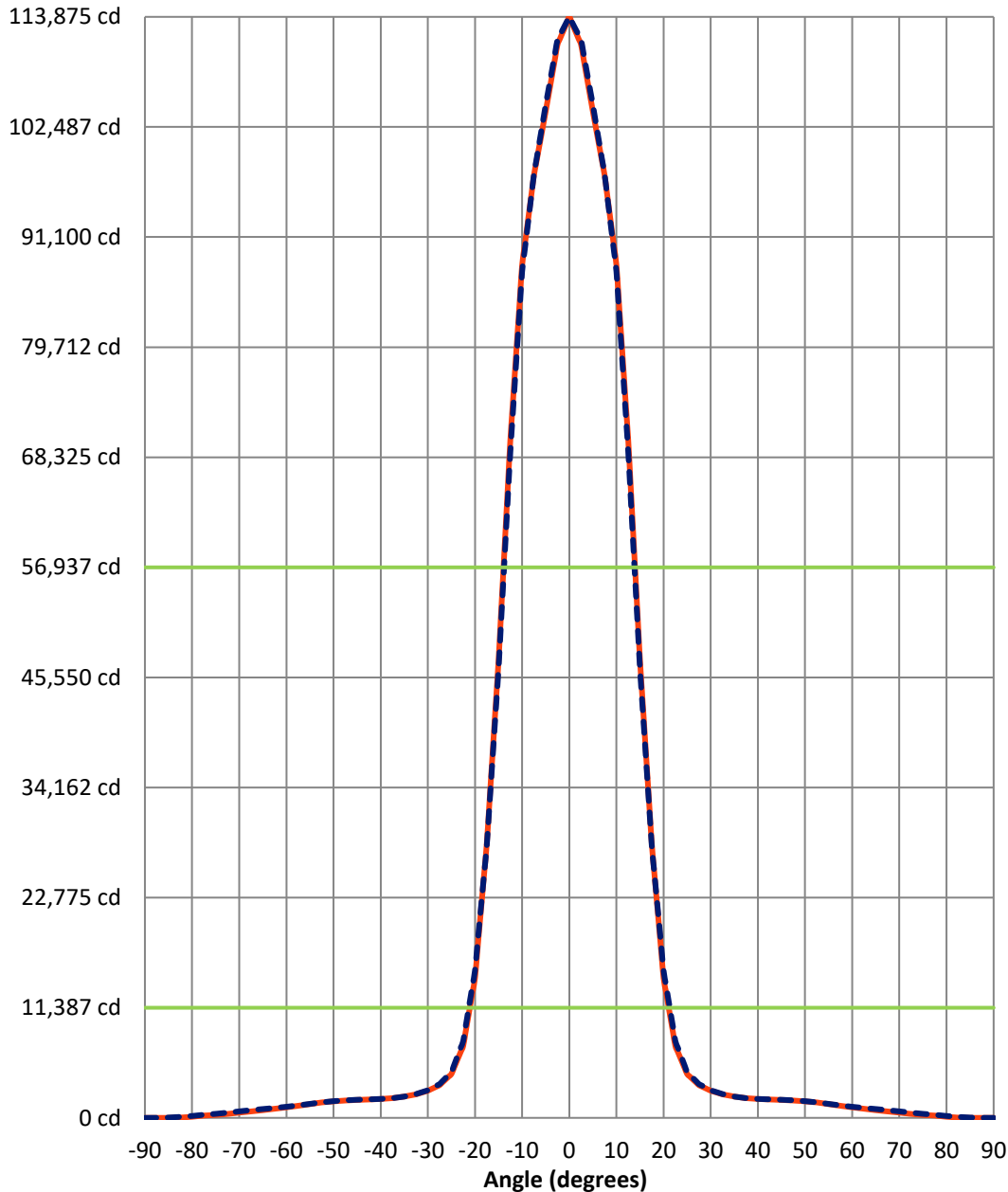
Luminous Intensity Polar Plot



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

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Luminous Intensity Plot



Beam:
 H Angle: 27.7°
 V Angle: 27.9°
 Lumens: 11273.6
 Efficiency: 37.2%

Field:
 H Angle: 42.6°
 V Angle: 42.2°
 Lumens: 17027.2
 Efficiency: 56.2%

Spill:
 Lumens: 13278.6
 Efficiency: 43.8%

— Vertical Distribution through 0-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°	0.9	0.9	0.9	0.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7
82.5°	26.2	25.3	24.4	25.3	25.3	26.2	26.2	27.0	27.9	28.8	28.8
80°	109.9	109.0	108.2	109.0	105.6	103.8	101.2	103.8	104.7	103.8	102.1
77.5°	238.1	238.1	238.1	232.9	228.5	223.3	217.2	212.8	208.5	203.2	198.0
75°	305.3	304.4	303.6	302.7	301.8	300.9	298.3	296.6	294.8	290.5	285.2
72.5°	404.8	403.0	402.1	398.6	396.9	393.4	390.8	389.9	386.4	381.2	372.5
70°	541.7	540.0	539.1	533.0	528.6	522.5	516.4	512.1	505.9	497.2	483.3
67.5°	663.8	662.1	662.1	656.9	654.2	648.1	644.6	641.2	635.0	626.3	608.9
65°	793.8	792.9	787.7	787.7	784.2	778.1	774.6	771.1	765.0	755.4	736.2
62.5°	941.2	936.0	927.3	926.4	922.0	915.1	909.0	903.7	895.9	885.4	861.8
60°	1088.7	1081.7	1071.2	1068.6	1062.5	1052.9	1045.0	1035.4	1024.1	1008.4	982.2
57.5°	1248.3	1238.7	1225.6	1220.4	1211.6	1198.6	1188.1	1173.3	1153.2	1130.5	1104.4
55°	1419.3	1410.5	1396.6	1389.6	1377.4	1360.8	1344.2	1325.0	1303.2	1273.6	1237.8
52.5°	1596.3	1588.5	1571.0	1555.3	1536.2	1515.2	1495.2	1473.3	1448.9	1414.0	1374.8
50°	1705.4	1698.4	1685.3	1672.2	1655.7	1637.3	1619.0	1598.1	1571.0	1537.9	1501.3
47.5°	1792.6	1783.9	1770.8	1757.7	1742.0	1727.2	1711.5	1693.2	1668.7	1640.8	1611.2
45°	1853.7	1846.7	1834.5	1822.3	1808.3	1795.2	1782.1	1769.9	1746.4	1723.7	1697.5
42.5°	1899.0	1892.9	1883.3	1872.0	1858.9	1848.4	1837.1	1821.4	1806.6	1788.2	1763.8
40°	1952.2	1943.5	1932.2	1921.7	1907.8	1895.5	1881.6	1867.6	1853.7	1839.7	1817.0
37.5°	2038.6	2029.0	2014.2	1999.4	1979.3	1957.5	1929.6	1913.0	1896.4	1878.1	1858.9
35°	2201.7	2190.4	2167.7	2140.7	2104.9	2061.3	2014.2	1981.9	1946.1	1919.1	1895.5
32.5°	2432.9	2447.7	2413.7	2370.1	2309.9	2234.0	2160.7	2096.2	2027.3	1980.2	1933.9
30°	2803.6	2827.2	2769.6	2699.8	2604.7	2487.0	2380.6	2268.9	2162.5	2071.8	2000.2
27.5°	3384.6	3366.3	3307.8	3196.2	3029.6	2826.3	2677.1	2504.4	2351.8	2195.6	2093.6
25°	4529.9	4504.6	4361.6	4088.5	3711.7	3354.1	3098.5	2808.0	2592.5	2391.9	2214.8
22.5°	7428.7	7376.3	6952.4	6110.6	5015.0	4307.5	3777.1	3257.2	2879.5	2619.6	2391.0
20°	14461.3	14226.6	12958.3	10858.6	8095.1	6560.7	4891.1	3983.0	3301.7	2888.2	2593.4
17.5°	28310.2	26980.8	24658.7	20537.8	15303.9	11354.1	7280.4	5190.3	4009.2	3270.3	2805.4
15°	47291.8	45155.5	41305.1	34960.7	26850.8	18685.9	11976.0	7343.2	4949.5	3778.9	3092.4
12.5°	70108.1	67125.7	61485.3	51917.7	40781.7	28964.4	18370.1	11178.7	6652.3	4369.4	3352.3
10°	88183.4	85096.3	79379.1	70220.6	55160.1	40116.1	26193.9	15426.1	8485.0	5253.1	3763.2
7.5°	97475.3	95114.8	91243.5	82692.2	69125.0	51181.5	34608.3	20923.4	11511.1	6377.5	4162.7
5°	104100.6	101745.3	97625.4	90591.0	78778.1	60953.1	41094.0	25241.4	13691.9	7198.4	4458.4
2.5°	111008.4	107294.1	102048.9	95209.0	84732.5	67022.7	44844.9	27334.9	14753.5	7672.9	4631.1
0°	113874.9	111512.6	104773.1	97548.6	87523.0	68884.3	46423.0	28115.6	15236.8	7936.3	4732.3



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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°	2.6	2.6	3.5	3.5	3.5	4.4	4.4	4.4	3.5	3.5	2.6
82.5°	27.9	27.9	27.0	25.3	24.4	22.7	20.1	16.6	12.2	11.3	10.5
80°	98.6	92.5	86.4	79.4	71.5	63.7	59.3	55.8	51.5	46.2	40.1
77.5°	191.0	184.1	176.2	167.5	155.3	143.1	130.0	117.8	104.7	92.5	80.3
75°	277.4	268.7	260.0	247.7	235.5	220.7	205.0	187.5	169.2	152.7	135.2
72.5°	358.5	343.7	330.6	321.0	311.4	297.5	280.9	260.8	239.0	216.3	192.8
70°	465.8	447.5	429.2	411.7	395.2	376.0	358.5	336.7	311.4	282.6	254.7
67.5°	586.2	562.6	538.2	517.3	494.6	471.9	447.5	417.8	386.4	355.0	321.9
65°	712.7	685.6	655.1	628.9	603.6	575.7	543.5	506.8	471.1	432.7	396.9
62.5°	835.7	806.9	776.4	745.0	712.7	680.4	651.6	604.5	560.0	514.7	470.2
60°	953.4	922.9	893.3	854.0	817.4	779.0	739.7	698.7	653.4	601.9	548.7
57.5°	1072.9	1035.4	999.7	961.3	919.4	875.8	832.2	787.7	739.7	688.3	629.8
55°	1199.4	1158.4	1115.7	1070.3	1024.1	974.4	922.0	872.3	822.6	767.6	707.4
52.5°	1332.9	1285.8	1235.2	1189.0	1130.5	1072.1	1011.9	955.2	899.4	842.7	780.7
50°	1458.5	1408.8	1353.8	1296.3	1236.9	1168.0	1100.0	1034.6	973.5	910.7	847.9
47.5°	1569.3	1522.2	1469.9	1407.0	1342.5	1262.2	1186.4	1113.9	1042.4	974.4	908.1
45°	1661.8	1621.6	1569.3	1512.6	1436.7	1355.6	1273.6	1189.8	1111.3	1035.4	964.8
42.5°	1735.0	1701.0	1654.8	1599.8	1527.4	1446.3	1359.1	1269.2	1178.5	1096.5	1018.0
40°	1793.5	1763.0	1728.1	1670.5	1612.0	1527.4	1439.3	1345.1	1248.3	1154.9	1069.5
37.5°	1837.1	1810.9	1777.8	1730.7	1670.5	1606.8	1514.3	1417.5	1319.8	1213.4	1120.9
35°	1872.9	1847.6	1816.2	1777.8	1723.7	1659.1	1584.1	1485.6	1380.0	1271.8	1171.5
32.5°	1907.8	1879.0	1849.3	1813.5	1768.2	1711.5	1640.0	1550.1	1441.9	1328.5	1217.8
30°	1944.4	1909.5	1877.2	1846.7	1804.0	1752.5	1688.8	1607.7	1500.4	1384.4	1265.7
27.5°	2005.5	1942.6	1904.3	1870.2	1834.5	1788.2	1728.1	1652.2	1555.3	1437.6	1312.8
25°	2093.6	1996.7	1932.2	1894.7	1858.0	1814.4	1762.1	1694.0	1603.3	1485.6	1358.2
22.5°	2197.4	2067.4	1976.7	1918.2	1879.0	1838.8	1790.9	1725.4	1639.1	1529.2	1400.9
20°	2347.4	2154.6	2021.2	1945.3	1899.9	1858.9	1813.5	1754.2	1671.4	1569.3	1439.3
17.5°	2494.8	2259.3	2089.2	1980.2	1918.2	1876.4	1833.6	1785.6	1699.3	1601.6	1473.3
15°	2667.5	2371.0	2153.8	2010.7	1934.8	1892.1	1849.3	1800.5	1725.4	1628.6	1503.9
12.5°	2819.3	2476.5	2224.4	2056.1	1959.2	1906.0	1864.1	1817.0	1749.0	1653.9	1530.0
10°	3026.9	2591.7	2296.8	2099.7	1981.9	1919.1	1876.4	1831.0	1769.1	1675.7	1551.9
7.5°	3203.1	2690.2	2360.5	2136.3	2002.0	1930.4	1886.8	1843.2	1784.8	1694.9	1570.2
5°	3363.7	2769.6	2408.5	2164.2	2018.5	1939.2	1895.5	1852.8	1797.8	1710.6	1584.1
2.5°	3481.4	2837.6	2450.3	2188.6	2031.6	1949.6	1905.1	1864.1	1810.1	1723.7	1598.1
0°	3498.0	2854.2	2460.8	2197.4	2036.0	1956.6	1912.1	1871.1	1816.2	1728.1	1600.7



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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	0.9	0.9	0.9	0.0	0.0
85°	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
82.5°	10.5	9.6	8.7	7.9	6.1	4.4	1.7	1.7	1.7	0.9	0.9
80°	33.1	25.3	17.4	16.6	14.8	12.2	8.7	6.1	2.6	1.7	1.7
77.5°	71.5	61.1	50.6	40.1	27.9	20.1	16.6	12.2	7.9	3.5	1.7
75°	119.5	102.1	86.4	71.5	56.7	41.0	25.3	19.2	14.0	8.7	2.6
72.5°	173.6	151.8	130.8	108.2	85.5	67.2	48.8	28.8	20.1	14.0	7.0
70°	230.3	204.1	178.0	151.8	123.9	93.3	71.5	49.7	27.0	19.2	11.3
67.5°	290.5	260.8	230.3	197.1	164.9	130.8	95.1	69.8	44.5	23.6	15.7
65°	356.8	320.1	283.5	246.9	206.7	168.4	129.1	89.8	61.1	33.1	19.2
62.5°	424.8	382.1	339.3	295.7	251.2	205.9	162.3	116.9	77.6	47.1	23.6
60°	498.1	446.6	396.0	346.3	294.8	245.1	195.4	146.5	96.0	60.2	27.9
57.5°	570.5	512.9	455.3	396.0	339.3	284.4	229.4	174.5	116.9	72.4	37.5
55°	643.8	578.3	515.5	445.8	382.1	321.9	262.6	205.0	139.6	85.5	47.1
52.5°	713.6	644.6	573.1	497.2	427.4	358.5	295.7	229.4	162.3	97.7	56.7
50°	780.7	707.4	628.9	546.9	467.6	394.3	327.1	256.5	183.2	116.0	65.4
47.5°	842.7	767.6	683.9	596.7	511.2	428.3	356.8	282.6	204.1	132.6	74.1
45°	895.0	823.5	734.5	644.6	552.2	464.9	384.7	307.9	225.9	148.3	82.9
42.5°	944.7	868.0	782.5	696.1	593.2	499.8	410.0	330.6	246.0	164.0	90.7
40°	989.2	909.0	827.8	731.9	633.3	533.9	436.2	352.4	266.1	178.0	100.3
37.5°	1032.0	947.3	863.6	771.1	671.7	564.4	463.2	372.5	285.2	191.9	110.8
35°	1072.9	984.0	896.7	806.9	706.6	595.8	488.5	390.8	303.6	205.9	121.3
32.5°	1113.1	1018.0	930.8	837.4	735.4	624.6	512.1	408.2	319.3	219.8	130.8
30°	1150.6	1051.1	957.8	864.5	763.3	651.6	534.7	425.7	333.2	232.9	139.6
27.5°	1190.7	1082.5	984.0	888.9	788.6	676.0	555.7	443.1	346.3	245.1	148.3
25°	1230.0	1110.5	1009.3	911.6	812.1	697.9	574.9	459.7	357.6	256.5	156.1
22.5°	1265.7	1138.4	1032.0	932.5	830.4	716.2	593.2	473.7	368.1	266.9	163.1
20°	1299.8	1167.2	1054.6	950.8	847.0	733.6	609.7	486.8	377.7	277.4	170.1
17.5°	1332.0	1194.2	1074.7	967.4	861.8	748.4	623.7	498.1	386.4	286.1	175.3
15°	1359.9	1217.8	1092.1	981.4	874.9	760.7	635.0	507.7	394.3	294.8	180.6
12.5°	1384.4	1237.8	1107.0	992.7	885.4	771.1	646.4	517.3	400.4	301.8	184.9
10°	1404.4	1253.5	1119.2	1002.3	894.1	781.6	655.1	525.1	405.6	307.9	188.4
7.5°	1420.1	1265.7	1129.7	1011.0	902.0	789.4	663.0	530.4	410.0	312.3	193.7
5°	1433.2	1277.1	1137.5	1017.1	908.1	799.9	671.7	538.2	415.2	318.4	194.5
2.5°	1444.6	1285.8	1144.5	1022.4	913.3	799.9	671.7	538.2	415.2	319.3	194.5
0°	1445.4	1287.5	1145.4	1023.2	913.3	799.9	671.7	538.2	415.2	320.1	194.5



REPORT NUMBER: P855612
 CATALOG NUMBER: NHRS100U33BZ750-75%

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°	0.9	0.9	0.0	0.0
82.5°	0.9	0.9	0.0	0.0
80°	0.9	0.9	0.9	0.0
77.5°	1.7	0.9	0.9	0.0
75°	1.7	1.7	0.9	0.0
72.5°	2.6	1.7	0.9	0.0
70°	2.6	1.7	0.9	0.0
67.5°	6.1	1.7	0.9	0.0
65°	9.6	2.6	0.9	0.0
62.5°	12.2	2.6	1.7	0.0
60°	15.7	2.6	1.7	0.0
57.5°	18.3	4.4	1.7	0.0
55°	21.8	7.0	1.7	0.0
52.5°	24.4	8.7	1.7	0.0
50°	27.0	10.5	1.7	0.0
47.5°	30.5	12.2	1.7	0.0
45°	37.5	14.0	2.6	0.0
42.5°	42.7	15.7	2.6	0.0
40°	48.8	17.4	2.6	0.0
37.5°	54.1	19.2	2.6	0.0
35°	59.3	20.9	2.6	0.0
32.5°	64.6	21.8	2.6	0.0
30°	69.8	23.6	2.6	0.0
27.5°	74.1	24.4	2.6	0.0
25°	77.6	26.2	2.6	0.0
22.5°	82.0	27.0	3.5	0.0
20°	85.5	27.9	3.5	0.0
17.5°	89.0	28.8	3.5	0.0
15°	91.6	29.7	3.5	0.0
12.5°	94.2	30.5	3.5	0.0
10°	96.0	31.4	3.5	0.0
7.5°	99.4	32.3	3.5	0.0
5°	100.3	32.3	3.5	0.0
2.5°	100.3	32.3	3.5	0.0
0°	101.2	32.3	3.5	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: SP1-2401-297-2

Test Date: 02/27/2024

Luminaire Tested: NHRS100U33BZ750

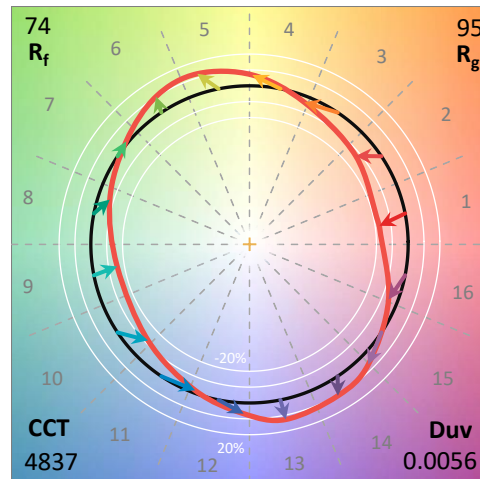
Data in this report applies to families of products NHRS100U33BZ750.

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2401-297-2
 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: **NHRS100U33BZ750**
 Description: LUMARK NIGHT HARRIER 4 PANEL FLOOD SELECTABLE CCT NEMA 3 AT 5000K.

Spectral Parameters

CCT (K):	4837	CRI (Ra):	71.3	R9:	-35.9
CIE u':	0.2093	R1:	67.6	R10:	43.7
CIE v':	0.4933	R2:	75.8	R11:	68.8
Duv:	0.0056	R3:	83.2	R12:	44.0
CIE x:	0.3512	R4:	71.9	R13:	68.5
CIE y:	0.3678	R5:	68.7	R14:	90.6
CIE z:	0.2809	R6:	67.6		
Peak Wavelength (nm):	445	R7:	80.9		
Dominant Wavelength (nm):	570	R8:	54.6		
Purity:	15.9				
Rf:	73.6				
Rg:	94.7				



Test Conditions

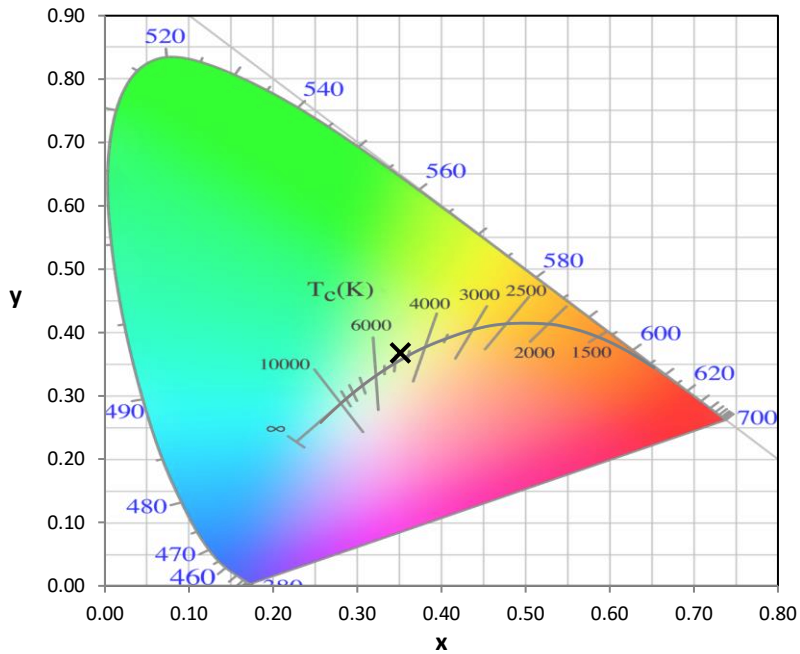
Stabilization Time: 22M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.9/30%
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2401-297-2

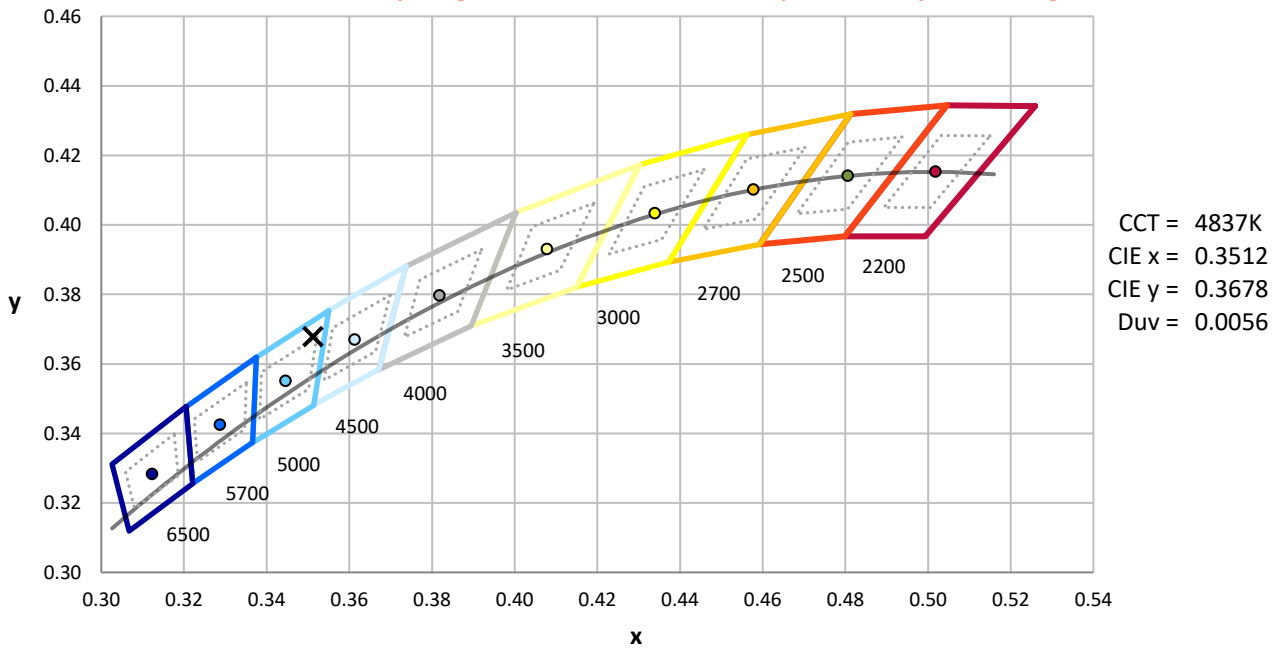
Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	2/12/2024	8/12/2024
Power Meter	XITRON 2801 IN0071	10/23/2023	10/23/2024
AC Power Source	CHROMA 61603 IN0063	10/24/2023	10/24/2024
DC Power Source	AGILENT E3634A IN0208	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: SP1-2401-297-2

CIE 1931 Chromaticity Diagram



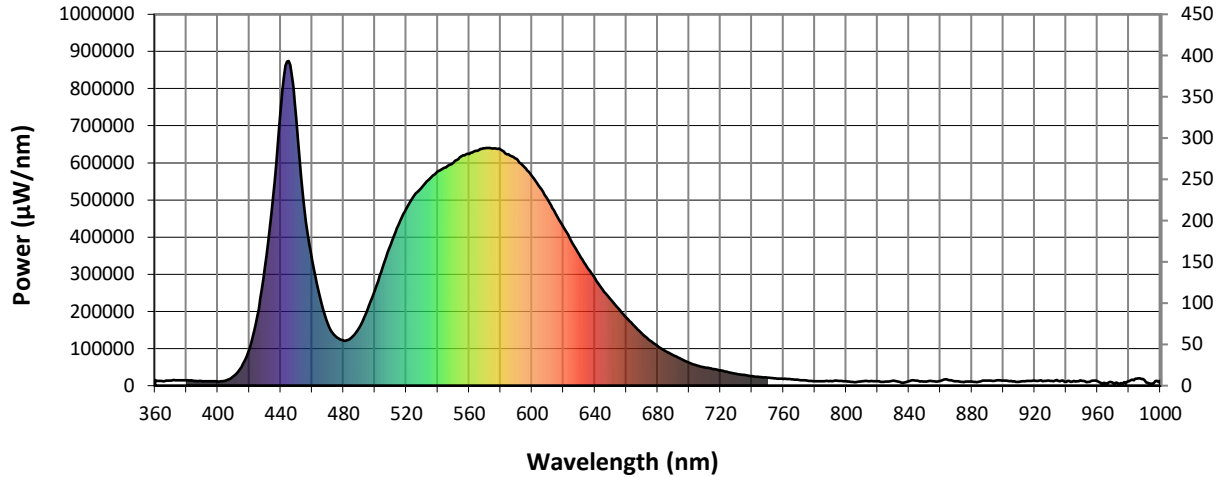
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 7-step quadrangle

REPORT NUMBER: SP1-2401-297-2

Photopic Flux vs. Wavelength

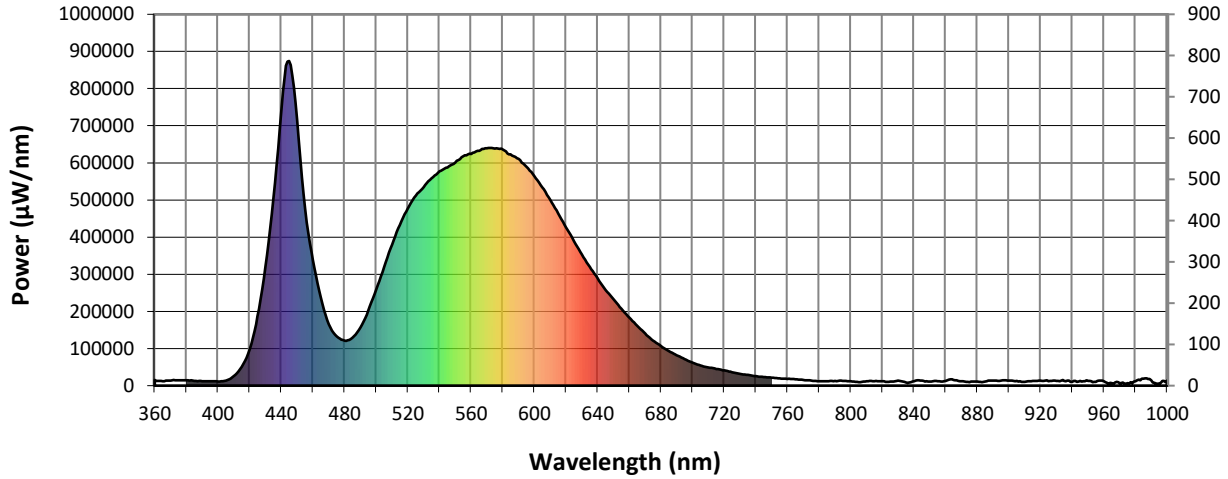


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λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	14929	NR	490	156872	NR	620	426646	NR	750	21636	NR	880	10635	NR
365	11663	NR	495	201588	NR	625	389645	NR	755	19294	NR	885	11054	NR
370	13676	NR	500	258301	NR	630	353066	NR	760	18310	NR	890	13653	NR
375	14812	NR	505	319162	NR	635	319718	NR	765	17431	NR	895	13616	NR
380	14674	NR	510	380062	NR	640	288986	NR	770	15164	NR	900	13982	NR
385	12382	NR	515	432656	NR	645	257900	NR	775	13513	NR	905	12342	NR
390	11999	NR	520	476960	NR	650	232099	NR	780	11469	NR	910	10200	NR
395	11880	NR	525	512061	NR	655	207197	NR	785	12052	NR	915	12678	NR
400	11127	NR	530	535142	NR	660	183199	NR	790	12754	NR	920	13836	NR
405	13930	NR	535	558328	NR	665	161040	NR	795	12821	NR	925	11713	NR
410	25393	NR	540	576885	NR	670	140120	NR	800	11812	NR	930	12572	NR
415	50349	NR	545	587950	NR	675	121728	NR	805	9356	NR	935	12749	NR
420	98098	NR	550	600643	NR	680	106806	NR	810	11676	NR	940	10259	NR
425	186895	NR	555	617484	NR	685	92775	NR	815	12164	NR	945	12514	NR
430	320236	NR	560	624145	NR	690	81733	NR	820	11604	NR	950	12788	NR
435	504450	NR	565	632478	NR	695	71387	NR	825	10706	NR	955	10484	NR
440	743682	NR	570	639368	NR	700	61789	NR	830	13474	NR	960	11973	NR
445	874242	NR	575	638303	NR	705	54194	NR	835	8702	NR	965	6759	NR
450	715574	NR	580	635962	NR	710	49021	NR	840	11970	NR	970	6888	NR
455	475983	NR	585	623054	NR	715	45016	NR	845	13590	NR	975	6755	NR
460	339018	NR	590	610770	NR	720	40860	NR	850	11012	NR	980	11558	NR
465	237270	NR	595	588838	NR	725	36452	NR	855	12312	NR	985	18361	NR
470	165263	NR	600	563194	NR	730	31730	NR	860	12946	NR	990	14502	NR
475	132708	NR	605	534124	NR	735	28876	NR	865	15199	NR	995	5688	NR
480	121456	NR	610	500589	NR	740	25374	NR	870	12096	NR	1000	13729	NR
485	128811	NR	615	463468	NR	745	23293	NR	875	9636	NR			

REPORT NUMBER: SP1-2401-297-2

Scotopic Flux vs. Wavelength

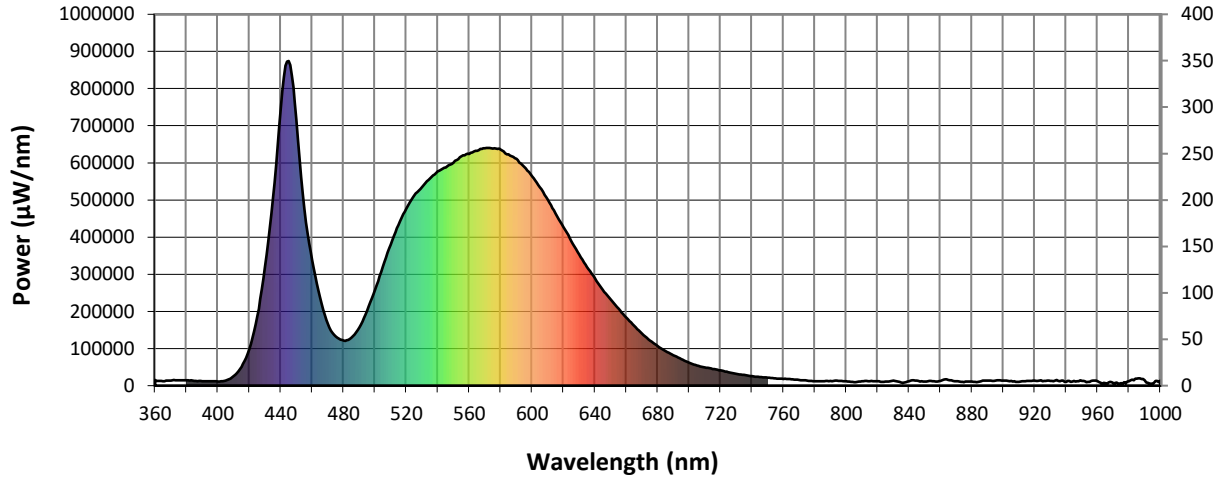


Scotopic Lumens: 65505.2 S/P: 1.73

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	14929	NR	490	156872	NR	620	426646	NR	750	21636	NR	880	10635	NR
365	11663	NR	495	201588	NR	625	389645	NR	755	19294	NR	885	11054	NR
370	13676	NR	500	258301	NR	630	353066	NR	760	18310	NR	890	13653	NR
375	14812	NR	505	319162	NR	635	319718	NR	765	17431	NR	895	13616	NR
380	14674	NR	510	380062	NR	640	288986	NR	770	15164	NR	900	13982	NR
385	12382	NR	515	432656	NR	645	257900	NR	775	13513	NR	905	12342	NR
390	11999	NR	520	476960	NR	650	232099	NR	780	11469	NR	910	10200	NR
395	11880	NR	525	512061	NR	655	207197	NR	785	12052	NR	915	12678	NR
400	11127	NR	530	535142	NR	660	183199	NR	790	12754	NR	920	13836	NR
405	13930	NR	535	558328	NR	665	161040	NR	795	12821	NR	925	11713	NR
410	25393	NR	540	576885	NR	670	140120	NR	800	11812	NR	930	12572	NR
415	50349	NR	545	587950	NR	675	121728	NR	805	9356	NR	935	12749	NR
420	98098	NR	550	600643	NR	680	106806	NR	810	11676	NR	940	10259	NR
425	186895	NR	555	617484	NR	685	92775	NR	815	12164	NR	945	12514	NR
430	320236	NR	560	624145	NR	690	81733	NR	820	11604	NR	950	12788	NR
435	504450	NR	565	632478	NR	695	71387	NR	825	10706	NR	955	10484	NR
440	743682	NR	570	639368	NR	700	61789	NR	830	13474	NR	960	11973	NR
445	874242	NR	575	638303	NR	705	54194	NR	835	8702	NR	965	6759	NR
450	715574	NR	580	635962	NR	710	49021	NR	840	11970	NR	970	6888	NR
455	475983	NR	585	623054	NR	715	45016	NR	845	13590	NR	975	6755	NR
460	339018	NR	590	610770	NR	720	40860	NR	850	11012	NR	980	11558	NR
465	237270	NR	595	588838	NR	725	36452	NR	855	12312	NR	985	18361	NR
470	165263	NR	600	563194	NR	730	31730	NR	860	12946	NR	990	14502	NR
475	132708	NR	605	534124	NR	735	28876	NR	865	15199	NR	995	5688	NR
480	121456	NR	610	500589	NR	740	25374	NR	870	12096	NR	1000	13729	NR
485	128811	NR	615	463468	NR	745	23293	NR	875	9636	NR			

REPORT NUMBER: SP1-2401-297-2

Melanopic Flux vs. Wavelength



Melanopic Lumens: 25839.2 M/P: 0.68

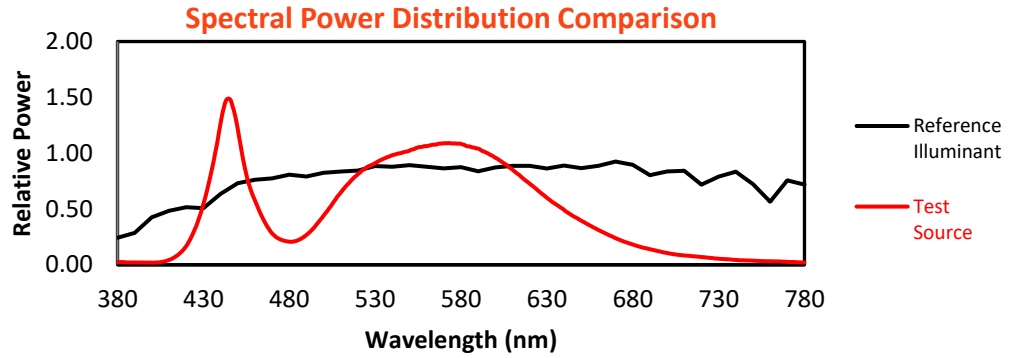
λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)	λ (nm)	Power (µW/nm)	Lumens (φ/nm)
360	14929	NR	490	156872	NR	620	426646	NR	750	21636	NR	880	10635	NR
365	11663	NR	495	201588	NR	625	389645	NR	755	19294	NR	885	11054	NR
370	13676	NR	500	258301	NR	630	353066	NR	760	18310	NR	890	13653	NR
375	14812	NR	505	319162	NR	635	319718	NR	765	17431	NR	895	13616	NR
380	14674	NR	510	380062	NR	640	288986	NR	770	15164	NR	900	13982	NR
385	12382	NR	515	432656	NR	645	257900	NR	775	13513	NR	905	12342	NR
390	11999	NR	520	476960	NR	650	232099	NR	780	11469	NR	910	10200	NR
395	11880	NR	525	512061	NR	655	207197	NR	785	12052	NR	915	12678	NR
400	11127	NR	530	535142	NR	660	183199	NR	790	12754	NR	920	13836	NR
405	13930	NR	535	558328	NR	665	161040	NR	795	12821	NR	925	11713	NR
410	25393	NR	540	576885	NR	670	140120	NR	800	11812	NR	930	12572	NR
415	50349	NR	545	587950	NR	675	121728	NR	805	9356	NR	935	12749	NR
420	98098	NR	550	600643	NR	680	106806	NR	810	11676	NR	940	10259	NR
425	186895	NR	555	617484	NR	685	92775	NR	815	12164	NR	945	12514	NR
430	320236	NR	560	624145	NR	690	81733	NR	820	11604	NR	950	12788	NR
435	504450	NR	565	632478	NR	695	71387	NR	825	10706	NR	955	10484	NR
440	743682	NR	570	639368	NR	700	61789	NR	830	13474	NR	960	11973	NR
445	874242	NR	575	638303	NR	705	54194	NR	835	8702	NR	965	6759	NR
450	715574	NR	580	635962	NR	710	49021	NR	840	11970	NR	970	6888	NR
455	475983	NR	585	623054	NR	715	45016	NR	845	13590	NR	975	6755	NR
460	339018	NR	590	610770	NR	720	40860	NR	850	11012	NR	980	11558	NR
465	237270	NR	595	588838	NR	725	36452	NR	855	12312	NR	985	18361	NR
470	165263	NR	600	563194	NR	730	31730	NR	860	12946	NR	990	14502	NR
475	132708	NR	605	534124	NR	735	28876	NR	865	15199	NR	995	5688	NR
480	121456	NR	610	500589	NR	740	25374	NR	870	12096	NR	1000	13729	NR
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REPORT NUMBER: SP1-2401-297-2

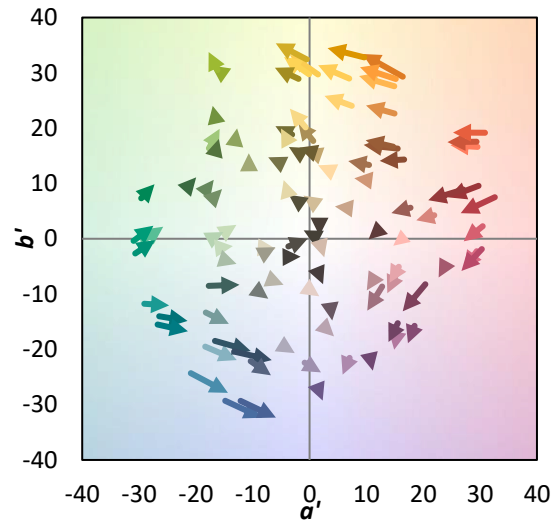
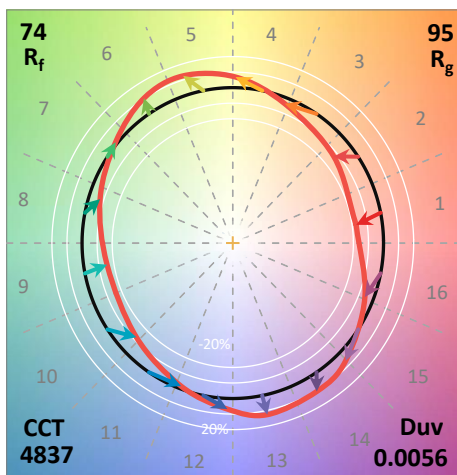
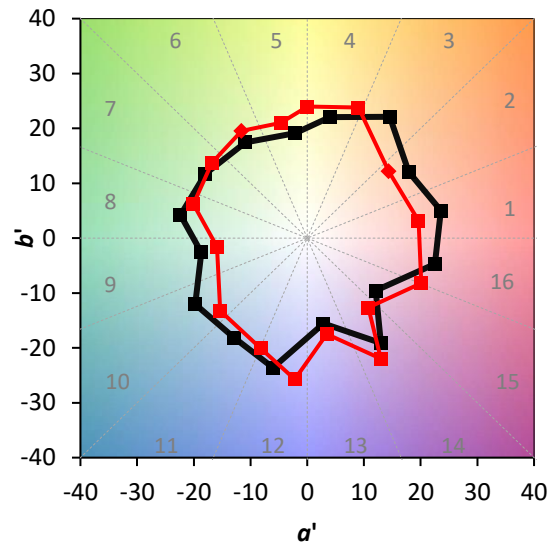
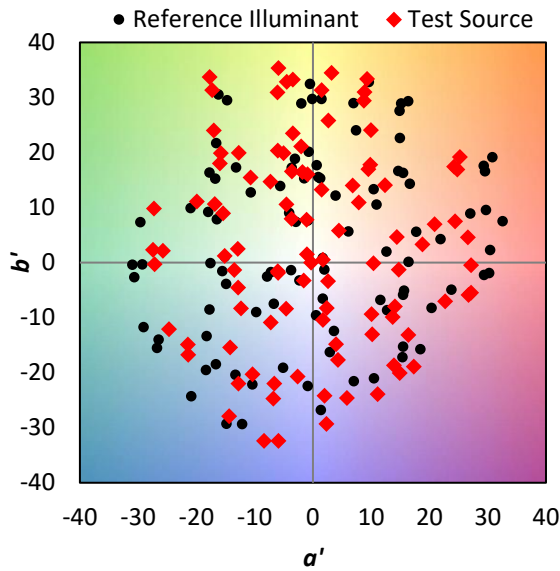
TM-30-18

Summary

$R_f = 73.6$
 $R_g = 94.7$
 CIE $R_a = 71.3$
 $R_g = -35.9$



Color Vector Graphics

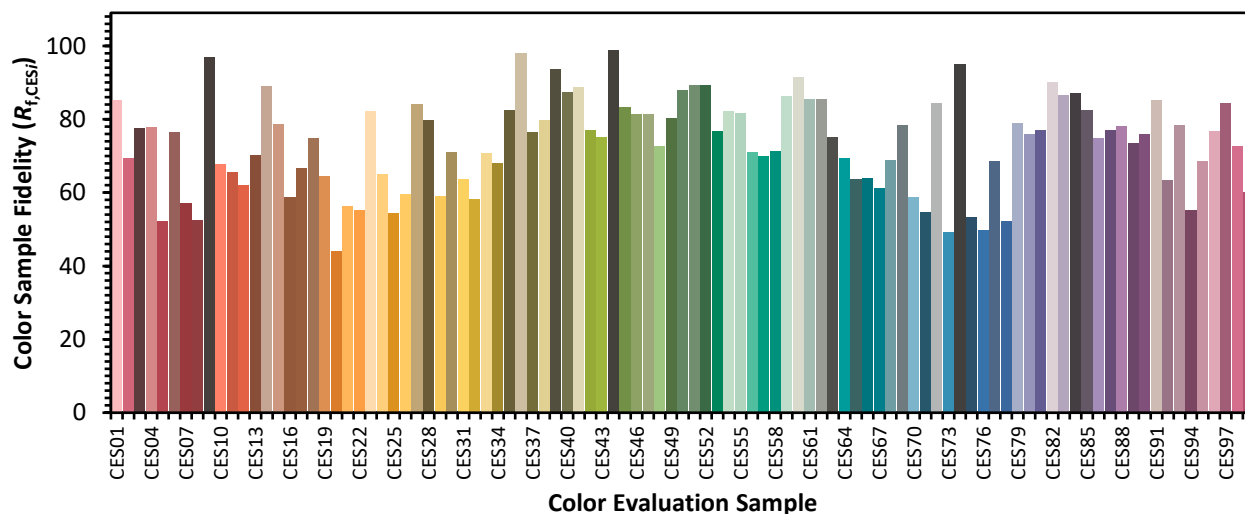


REPORT NUMBER: SP1-2401-297-2

TM-30-18

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

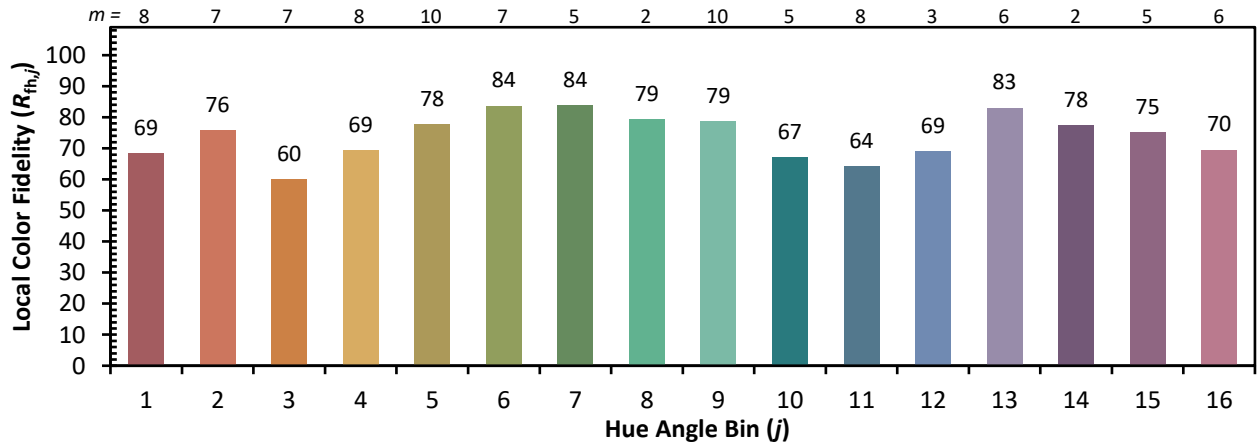
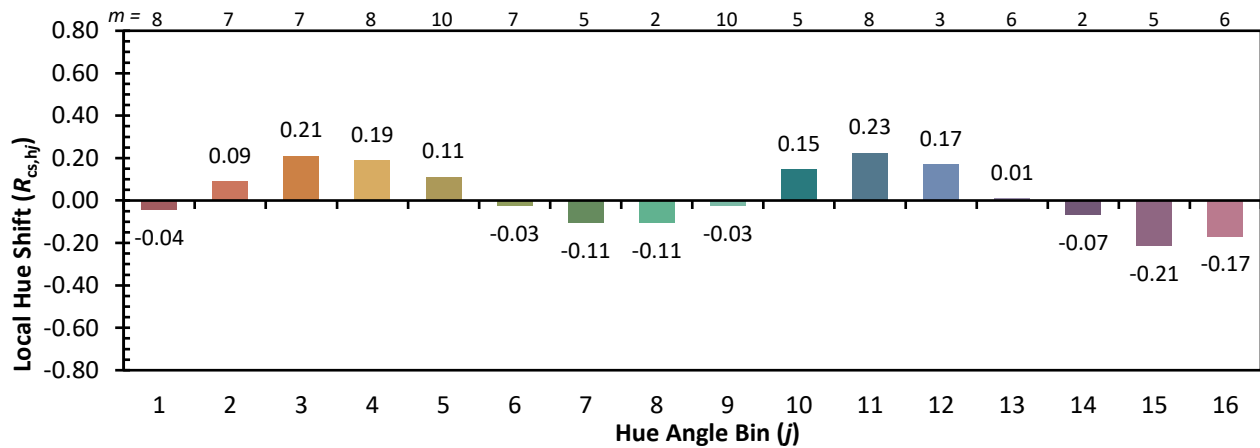
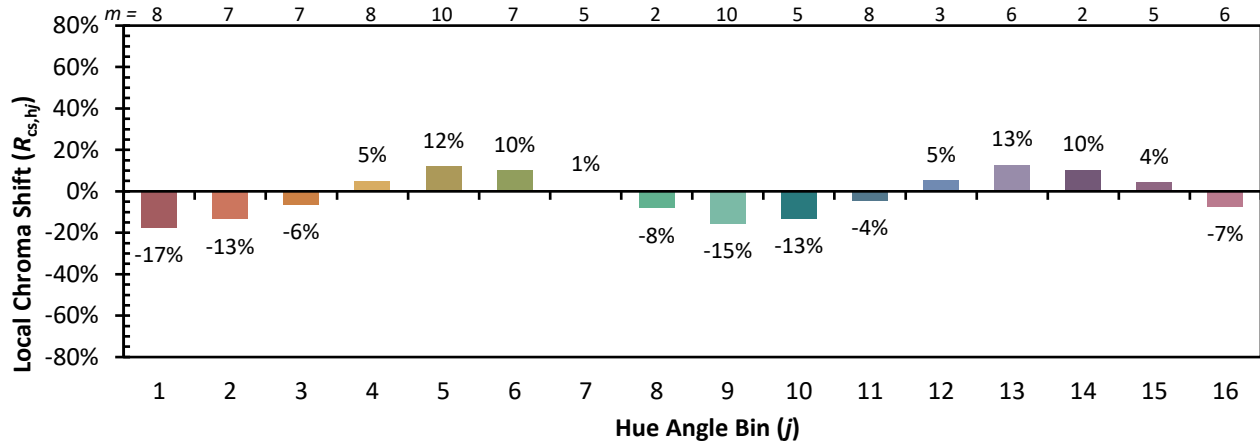
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CES02 = 59	CES27 = 84	CES52 = 89	CES77 = 69
CES03 = 30	CES28 = 80	CES53 = 77	CES78 = 52
CES04 = 69	CES29 = 59	CES54 = 82	CES79 = 79
CES05 = 46	CES30 = 71	CES55 = 82	CES80 = 76
CES06 = 50	CES31 = 64	CES56 = 71	CES81 = 77
CES07 = 39	CES32 = 58	CES57 = 70	CES82 = 90
CES08 = 38	CES33 = 71	CES58 = 71	CES83 = 87
CES09 = 29	CES34 = 68	CES59 = 86	CES84 = 87
CES10 = 72	CES35 = 82	CES60 = 91	CES85 = 83
CES11 = 56	CES36 = 98	CES61 = 86	CES86 = 75
CES12 = 61	CES37 = 77	CES62 = 86	CES87 = 77
CES13 = 41	CES38 = 80	CES63 = 75	CES88 = 78
CES14 = 74	CES39 = 94	CES64 = 69	CES89 = 73
CES15 = 70	CES40 = 87	CES65 = 64	CES90 = 76
CES16 = 46	CES41 = 89	CES66 = 64	CES91 = 85
CES17 = 49	CES42 = 77	CES67 = 61	CES92 = 63
CES18 = 55	CES43 = 75	CES68 = 69	CES93 = 78
CES19 = 71	CES44 = 99	CES69 = 78	CES94 = 55
CES20 = 64	CES45 = 83	CES70 = 59	CES95 = 68
CES21 = 85	CES46 = 81	CES71 = 55	CES96 = 77
CES22 = 77	CES47 = 81	CES72 = 84	CES97 = 84
CES23 = 91	CES48 = 73	CES73 = 49	CES98 = 73
CES24 = 90	CES49 = 80	CES74 = 95	CES99 = 60
CES25 = 71	CES50 = 88	CES75 = 53	



REPORT NUMBER: SP1-2401-297-2

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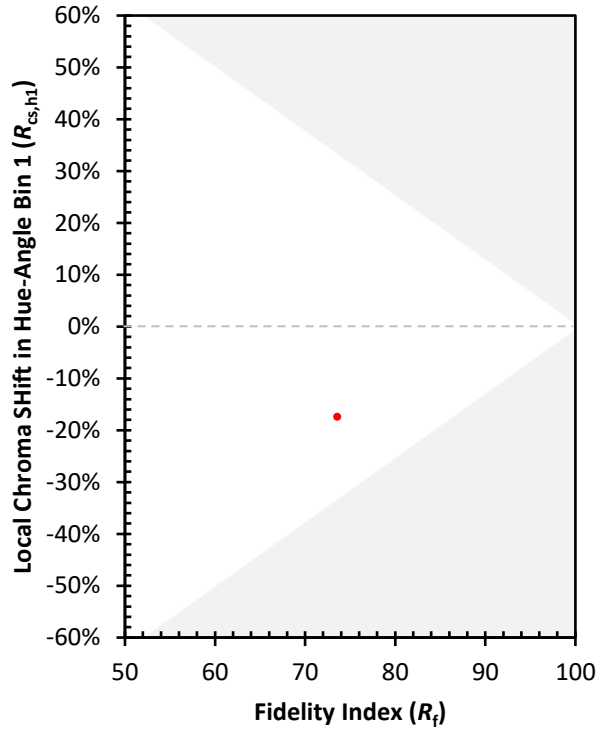
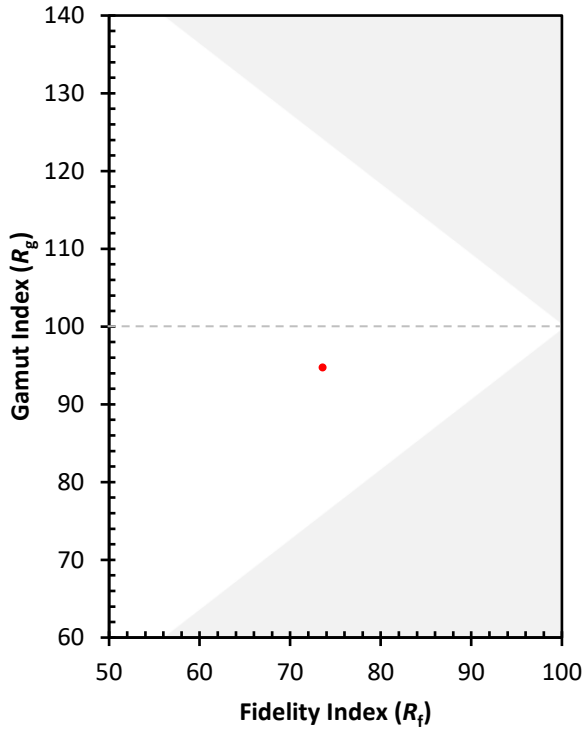
Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-2401-297-2

TM-30-18

Measure Comparisons



(END OF REPORT)