

Report Number: PL16874-002A
Model: C-SW-A-S66L-SCCT-US-UC-WH (55W/3500K)
Date: 07/13/2022

Cree Racine Engineering Services Testing Laboratory (RESTL) Photometric Testing and Evaluation Report

Prepared For:

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Cree Lighting

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Prepared By:



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Approved By:



Jonathan Vollers, Technical Manager

Product Information

Manufacturer	Cree Lighting
Model Number (SKU)	C-SW-A-S66L-SCCT-US-UC-WH (55W/3500K)
Serial Number	16874-002
LED Type	SSC STW8A2PD

Product Description

C-Lite Stairwell Light with selectable CCT & Wattage 120V-347V

Driver Information (Where Applicable)

SIL60-I1200 120-347 W D1S+D3 P

Length	Width	Height
48.0"	4.87"	5.5"

Sample

The following sample was submitted for evaluation



Key Photometric Data	Sphere Output	Goniophotometer	
Luminous Flux	7001.6	6843	lm
Efficacy	112.32	110.64	lm/W
Correlated Color Temperature (CCT)	3381	K	
Color Rendering Index (CRI)	85		
R ₉	19		
Duv	-0.0006		
S/P Ratio*	1.51		
CIE Type	Direct		

	Sphere		Goniophotometer		
Electrical Measurements	120V	277V	120V	277V	
Input Wattage	62.34	63.41	61.85	61.38	W
Input Current	0.530	0.252	0.524	0.242	A
Input Voltage	120.07	277.49	120.16	277.20	V
Power Factor	0.979	0.908	0.983	0.916	
Off-State Power	0	0	0	0	W
Total Harmonic Distortion (Voltage)	0.11	0.10	0.17	0.20	%
Total Harmonic Distortion (Amperage)	15.46	22.95	15.22	23.39	%

Note: All photometric measurements taken at 120VAC.

Key Test Parameters	Sphere Output	Goniophotometer	
Stabilization Time	55	30	min
Total Operating Time (Stabilization + Test)	65	50	min
Ambient Temperature	24.72	25.0	°C

Spacing Criteria

Spacing Criterion (0 - 180)	1.68
Spacing Criterion (90 - 270)	1.24
Spacing Criterion (Diagonal)	1.40

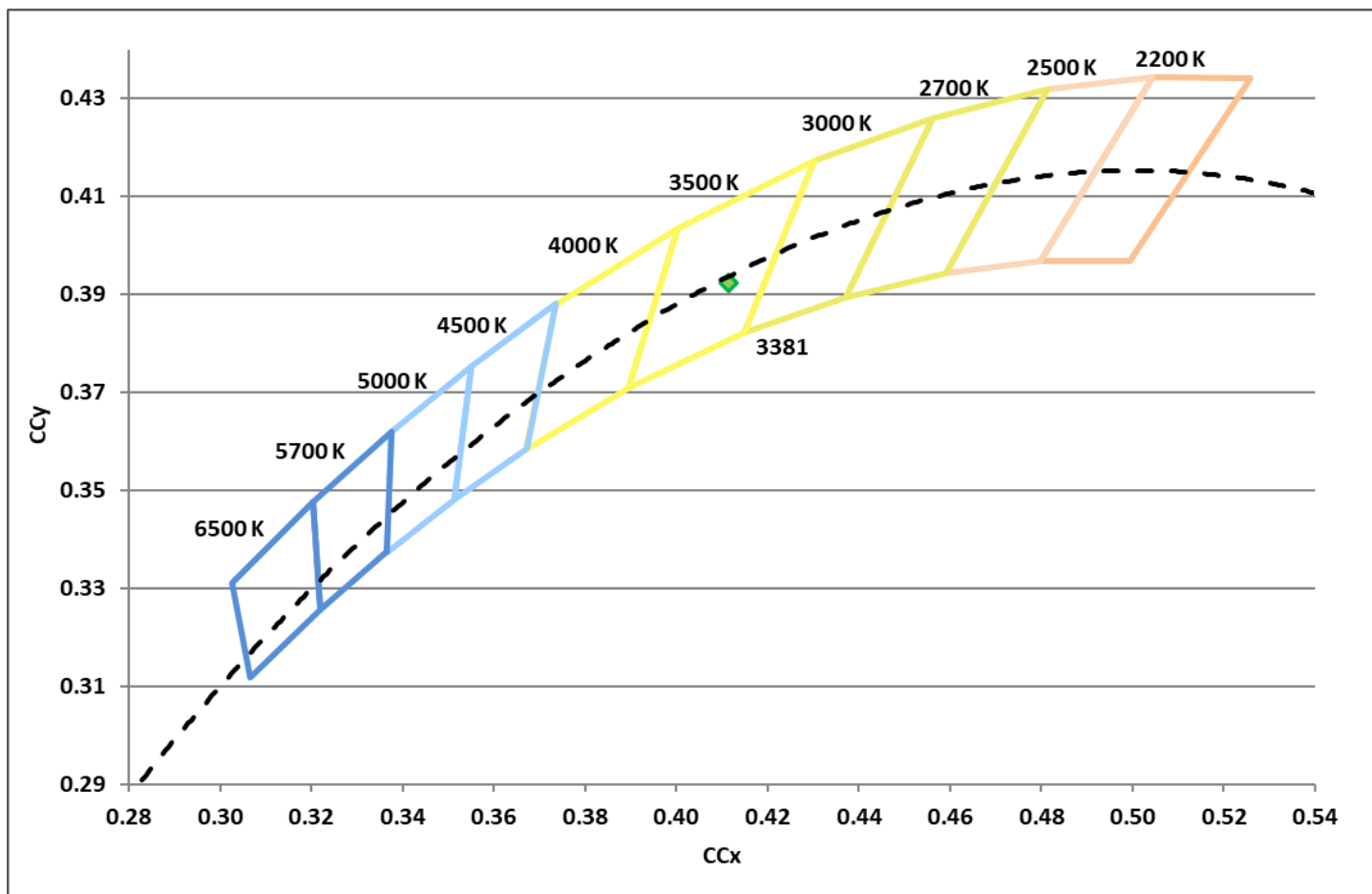
Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.4115	0.3923	0.2391	0.3419	0.2391	0.5128	-0.0006

Color Rendering Index Details

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
85	84	92	97	83	84	89	85	66	19	81	83	67	86	99

Chromaticity Diagram



Spectral Distribution

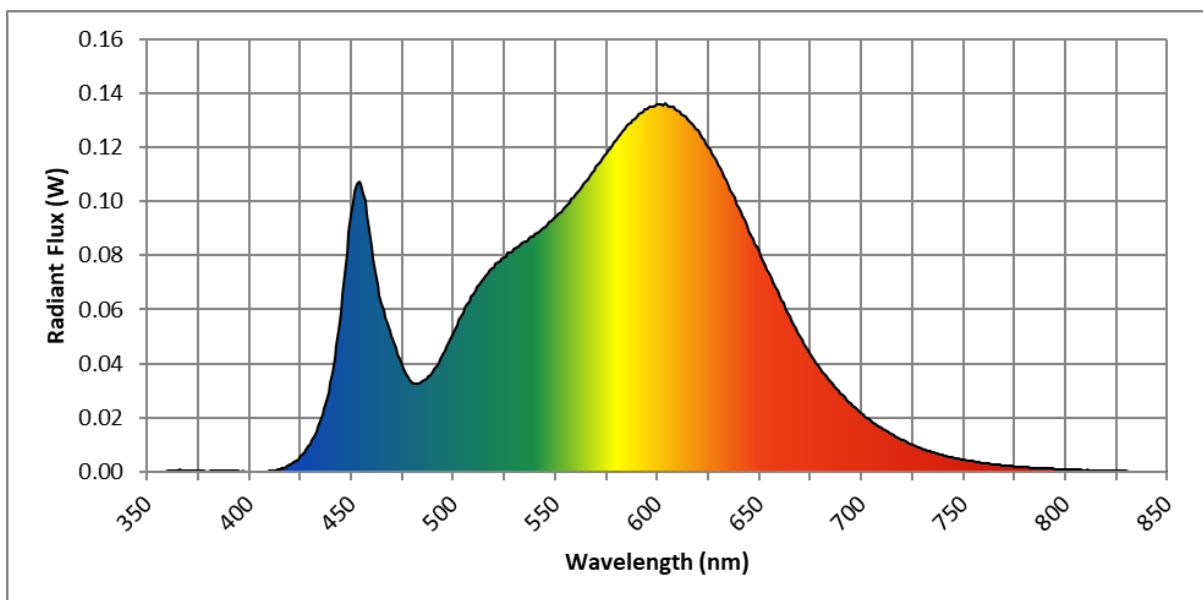
$\lambda(\text{nm})$	W/nm
360	0.000447
370	0.000543
380	0.000024
390	0.000254
400	0.000124
410	0.000270
420	0.002603
430	0.010407
440	0.032877
450	0.095200
460	0.083512
470	0.050062
480	0.033141
490	0.037109
500	0.050597
510	0.065857
520	0.075840

$\lambda(\text{nm})$	W/nm
530	0.082402
540	0.087768
550	0.094139
560	0.102619
570	0.112695
580	0.122919
590	0.131363
600	0.135700
610	0.133680
620	0.126154
630	0.113654
640	0.097843
650	0.081496
660	0.065469
670	0.050401
680	0.038200
690	0.029135

$\lambda(\text{nm})$	W/nm
700	0.021869
710	0.016116
720	0.011928
730	0.008545
740	0.006253
750	0.004495
760	0.003261
770	0.002330
780	0.001662
790	0.001224
800	0.000894
810	0.000600
820	0.000451
830	0.000337

Dominant Wavelength	581	nm
Peak Wavelength	602	nm

Spectral Power Distribution (W/nm)



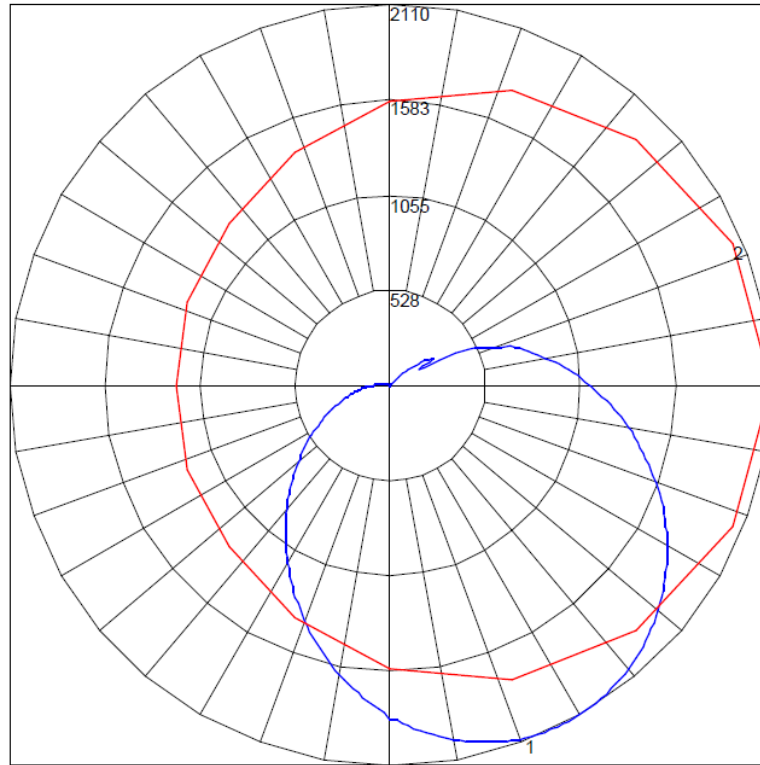
Zonal Lumen Summary

Zone	Lumens	% of Total	Zone	Lumens
0-20	678.3	9.9	0-10	175.59
0-30	1441.41	21.1	10-20	502.71
0-40	2368.42	34.6	20-30	763.10
0-60	4288.65	62.7	30-40	927.02
0-80	5737.62	83.8	40-50	982.44
0-90	6197.57	90.6	50-60	937.79
10-90	6021.97	88	60-70	811.60
20-40	1690.12	24.7	70-80	637.38
20-50	2672.56	39.1	80-90	459.95
40-70	2731.82	39.9	90-100	320.32
60-80	1448.97	21.2	100-110	203.26
70-80	637.38	9.3	110-120	85.01
80-90	459.95	6.7	120-130	33.80
90-110	523.58	7.7	130-140	3.38
90-120	608.59	8.9	140-150	0.00
90-130	642.39	9.4	150-160	0.01
90-150	645.76	9.4	160-170	0.06
90-180	645.88	9.4	170-180	0.04
110-180	122.3	1.8		
Total	6843.45	100		

Luminance Data (Cd./Sq.M)

Average in Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	15265	14126	12733
55	15320	13787	11610
65	15474	13486	10073
75	15841	13443	7555
85	16910	14096	2808

Candela Plots



Maximum Candela = 2110.03 Located At Horizontal Angle = 0, Vertical Angle = 28
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (28) (Through Max. Cd.)

Coefficients of Utilization

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	117	117	117	117	113	113	113	113	106	106	106	99	99	99	93	93	93	91
1	104	98	93	88	100	95	90	86	89	85	82	83	80	77	78	76	73	71
2	94	84	77	70	90	82	75	69	77	71	66	72	67	63	67	63	60	57
3	85	74	65	57	82	71	63	56	67	60	54	63	57	52	59	54	50	47
4	78	65	55	48	74	63	54	47	59	52	46	55	49	44	52	47	42	40
5	71	58	48	41	68	56	47	40	53	45	39	50	43	38	47	41	37	34
6	66	52	42	36	63	50	41	35	47	40	34	45	38	33	42	37	32	30
7	61	47	38	31	58	45	37	31	43	35	30	41	34	29	39	33	28	26
8	56	43	34	28	54	41	33	27	39	32	27	37	31	26	35	30	25	23
9	53	39	31	25	51	38	30	25	36	29	24	34	28	23	33	27	23	21
10	49	36	28	22	48	35	27	22	33	26	22	32	26	21	30	25	21	19

Candela Tabulations

	0	22.5	45	67.5	90	112.5	135	157.5	180
0	1856.9	1856.9	1856.9	1856.9	1856.9	1856.9	1856.9	1856.9	1856.9
1	1858.4	1861.2	1862.3	1878.7	1886.5	1863.6	1835.3	1826.5	1820.1
2	1877.1	1877.8	1874.2	1884.0	1884.8	1855.1	1821.2	1808.4	1800.7
3	1893.7	1893.1	1886.3	1889.5	1882.8	1845.6	1806.3	1789.8	1780.3
4	1909.8	1907.9	1897.3	1893.1	1879.2	1835.8	1790.5	1770.4	1759.3
5	1925.4	1922.5	1907.0	1896.6	1875.7	1824.2	1773.8	1750.7	1738.7
6	1940.2	1935.5	1915.6	1899.2	1871.4	1812.6	1757.4	1731.3	1717.7
7	1954.7	1948.9	1923.4	1901.2	1866.0	1801.0	1739.9	1711.0	1695.8
8	1969.4	1961.6	1931.5	1901.6	1859.5	1788.5	1722.4	1690.4	1674.7
9	1983.2	1973.1	1938.2	1902.4	1852.3	1774.9	1704.3	1669.3	1653.1
10	1997.3	1983.7	1944.8	1902.4	1844.6	1759.8	1685.9	1648.2	1631.3
11	2009.4	1994.4	1950.8	1900.7	1835.9	1745.1	1666.4	1625.9	1607.9
12	2021.4	2003.7	1955.3	1898.9	1826.4	1729.1	1645.8	1603.2	1584.6
13	2033.0	2012.7	1959.3	1895.9	1815.5	1712.6	1625.1	1580.9	1560.9
14	2043.7	2020.6	1962.9	1893.0	1805.1	1695.1	1603.9	1557.3	1536.4
15	2053.2	2028.4	1965.3	1888.2	1792.6	1677.4	1581.7	1533.8	1512.1
16	2063.0	2035.8	1967.2	1883.1	1779.7	1658.5	1559.4	1510.0	1488.2
17	2070.7	2041.8	1968.2	1877.1	1766.7	1639.2	1536.5	1486.0	1462.7
18	2077.6	2046.4	1968.5	1871.2	1752.5	1619.2	1513.8	1462.1	1437.7
19	2084.3	2050.9	1967.8	1864.0	1738.2	1598.5	1490.1	1438.1	1412.8
20	2089.6	2054.2	1965.9	1856.1	1723.0	1577.9	1466.4	1413.5	1387.9
21	2094.5	2056.7	1963.7	1846.8	1707.4	1556.5	1443.0	1389.4	1363.5
22	2098.9	2058.9	1961.0	1838.1	1691.0	1534.7	1419.1	1365.0	1338.7
23	2102.3	2060.3	1957.4	1827.7	1674.0	1512.7	1395.6	1340.4	1315.2
24	2105.5	2060.7	1953.3	1817.0	1656.1	1489.6	1371.2	1316.3	1291.2
25	2107.8	2060.9	1948.4	1805.2	1639.6	1466.8	1346.5	1291.4	1266.8
26	2108.9	2060.2	1942.8	1792.7	1621.3	1444.1	1321.1	1266.1	1242.1
27	2109.8	2059.2	1935.9	1779.8	1599.5	1421.6	1295.3	1240.7	1217.5
28	2110.0	2056.9	1928.9	1767.0	1578.0	1397.0	1269.7	1215.3	1191.9
29	2109.8	2054.4	1921.0	1752.3	1557.1	1370.6	1243.7	1189.8	1165.9
30	2108.0	2050.9	1912.2	1736.1	1535.3	1344.4	1217.3	1164.5	1140.7
31	2106.2	2047.1	1903.1	1719.9	1513.3	1318.9	1191.1	1139.7	1115.7
32	2102.9	2041.9	1893.2	1703.8	1491.0	1292.7	1164.6	1114.3	1090.0
33	2099.3	2035.5	1882.5	1687.7	1468.2	1266.5	1139.0	1089.3	1064.6
34	2095.1	2028.8	1870.9	1670.3	1444.7	1240.3	1114.0	1064.0	1040.1
35	2089.2	2021.9	1859.0	1652.7	1421.0	1213.8	1088.5	1039.1	1015.6
36	2083.5	2013.8	1846.9	1634.7	1396.6	1187.1	1062.4	1014.2	991.2

Candela Tabulations (Continued)

	0	22.5	45	67.5	90	112.5	135	157.5	180
37	2077.4	2005.6	1834.0	1616.0	1372.0	1160.4	1035.8	990.0	967.1
38	2070.3	1996.8	1820.5	1596.6	1346.7	1133.2	1008.8	965.2	943.5
39	2062.8	1987.1	1806.4	1577.3	1321.6	1105.3	982.2	940.5	919.3
40	2053.4	1977.1	1792.1	1556.9	1296.1	1076.5	955.8	915.0	892.6
41	2044.6	1965.9	1776.8	1535.7	1270.0	1048.6	929.6	888.9	868.9
42	2034.9	1954.8	1760.3	1514.6	1243.4	1019.5	901.1	864.3	845.7
43	2024.8	1942.8	1744.2	1492.5	1216.2	991.6	873.6	840.4	822.8
44	2015.0	1930.1	1726.7	1470.5	1189.1	963.0	848.0	816.9	800.5
45	2003.5	1917.3	1709.6	1448.6	1161.5	934.3	821.8	793.7	777.7
46	1991.9	1903.6	1692.1	1425.5	1133.8	903.6	797.1	771.0	755.2
47	1980.4	1889.7	1674.0	1402.5	1105.6	874.3	772.3	748.7	733.2
48	1968.3	1875.1	1655.4	1379.4	1077.7	846.8	747.8	726.6	711.2
49	1956.0	1860.5	1636.5	1355.3	1049.6	818.8	723.1	704.9	689.8
50	1942.6	1845.0	1617.4	1331.4	1020.6	791.1	699.1	683.2	669.0
51	1928.2	1829.0	1597.4	1306.8	992.3	763.4	675.4	662.2	649.2
52	1912.7	1812.8	1577.8	1282.3	964.1	735.5	651.3	641.2	628.4
53	1896.1	1795.7	1556.9	1257.5	934.9	707.8	628.0	620.5	608.8
54	1879.9	1777.5	1535.5	1231.9	904.7	679.8	604.9	600.1	589.9
55	1863.3	1759.1	1513.6	1206.3	873.7	652.3	582.2	579.8	570.7
56	1845.5	1740.2	1491.4	1179.8	844.2	624.2	559.8	559.7	551.1
57	1827.2	1720.5	1468.8	1153.7	814.4	597.3	537.5	540.0	532.8
58	1809.2	1700.3	1445.7	1127.1	784.3	570.4	515.9	521.0	514.1
59	1790.6	1679.9	1423.5	1100.1	754.0	543.7	494.3	501.8	495.1
60	1772.0	1660.2	1400.6	1073.2	723.7	517.4	473.4	483.1	477.1
61	1753.4	1638.7	1377.0	1046.7	693.9	491.5	453.0	464.6	460.2
62	1734.3	1618.7	1353.9	1019.3	663.8	465.8	433.2	447.0	442.7
63	1715.1	1598.3	1331.1	992.6	633.5	440.7	413.6	429.3	426.2
64	1696.1	1577.1	1307.1	965.2	603.9	415.8	395.1	412.7	411.0
65	1675.9	1556.5	1284.0	938.1	574.2	391.7	376.7	396.0	395.3
66	1655.1	1534.6	1260.8	910.2	544.6	367.6	358.6	380.0	379.1
67	1634.6	1512.7	1236.9	879.8	515.3	344.3	340.8	363.8	365.2
68	1612.4	1489.2	1212.0	851.9	485.7	321.7	323.6	348.4	350.4
69	1589.4	1466.8	1188.5	824.5	455.7	299.8	306.2	332.8	335.6
70	1566.0	1442.8	1164.0	796.6	426.0	278.4	289.8	318.0	321.8
71	1543.2	1418.8	1139.7	768.3	396.1	257.8	274.0	303.5	308.8
72	1519.6	1395.0	1116.5	740.7	366.4	237.8	258.3	289.3	294.7
73	1497.5	1372.3	1092.9	713.5	336.9	218.7	243.0	275.7	281.5

Candela Tabulations (Continued)

	0	22.5	45	67.5	90	112.5	135	157.5	180
74	1474.1	1348.0	1068.6	686.6	308.3	200.4	228.9	262.4	270.0
75	1452.6	1323.4	1045.1	660.0	279.7	183.0	214.8	249.8	257.1
76	1430.1	1301.2	1022.7	633.7	252.3	166.6	201.3	237.3	245.0
77	1408.8	1278.1	998.6	607.4	225.0	150.9	188.4	225.6	233.8
78	1386.2	1255.0	975.9	582.3	198.9	136.1	176.2	213.7	222.7
79	1364.7	1233.3	954.2	557.7	173.4	121.9	164.0	202.3	210.4
80	1342.2	1210.3	931.4	533.4	148.7	108.6	152.5	191.0	199.8
81	1318.8	1186.3	907.0	509.0	125.1	96.0	141.6	180.1	189.4
82	1295.0	1164.4	883.5	485.9	102.8	84.2	130.6	169.1	178.1
83	1272.7	1141.1	860.8	462.8	81.5	73.1	120.4	158.4	167.8
84	1247.0	1116.9	837.7	440.2	62.0	63.0	110.6	148.2	158.6
85	1222.7	1094.0	816.3	418.3	44.7	53.4	100.7	138.0	148.2
86	1200.0	1072.1	794.5	397.0	29.5	44.8	91.3	128.5	138.7
87	1174.7	1047.6	772.3	376.3	17.0	36.9	82.8	119.4	130.5
88	1151.3	1026.3	751.6	357.1	7.6	29.8	74.5	110.5	121.5
89	1129.3	1005.3	731.1	338.4	1.7	23.6	66.6	102.1	112.5
90	1107.9	982.3	710.3	320.1	0.0	18.1	59.3	93.8	104.5
91	1084.1	960.7	690.3	302.8	0.0	13.2	51.9	85.3	95.6
92	1064.0	940.2	671.3	286.7	0.0	9.1	44.9	77.3	86.8
93	1040.5	916.5	651.2	270.3	0.0	5.9	38.7	69.5	79.1
94	1017.4	893.6	632.1	254.9	0.0	3.1	32.8	62.1	71.3
95	995.4	872.2	612.9	240.2	0.0	0.7	27.2	54.9	63.3
96	971.7	850.5	593.3	225.7	0.0	0.0	22.4	48.3	56.5
97	948.1	828.5	574.2	212.0	0.0	0.0	17.5	41.7	49.7
98	925.6	808.1	556.0	199.1	0.0	0.0	12.9	35.6	42.6
99	899.8	787.2	537.0	186.3	0.0	0.0	8.8	29.7	36.5
100	875.7	765.1	518.2	173.8	0.0	0.0	5.2	23.9	30.7
101	853.8	744.8	500.3	161.6	0.0	0.0	1.9	18.8	24.6
102	831.2	724.6	481.9	147.4	0.0	0.0	0.0	13.8	19.2
103	808.9	703.3	462.2	129.8	0.0	0.0	0.0	9.2	14.4
104	786.8	683.7	440.3	110.9	0.0	0.0	0.0	5.1	9.4
105	767.0	663.6	414.2	92.7	0.0	0.0	0.0	1.7	5.1
106	744.5	636.2	385.9	76.3	0.0	0.0	0.0	0.0	1.5
107	723.0	598.1	356.2	61.7	0.0	0.0	0.0	0.0	0.0
108	694.8	555.8	320.1	48.3	0.0	0.0	0.0	0.0	0.0
109	652.7	520.2	270.6	35.6	0.0	0.0	0.0	0.0	0.0
110	608.2	494.8	221.2	24.0	0.0	0.0	0.0	0.0	0.0

Candela Tabulations (Continued)

	0	22.5	45	67.5	90	112.5	135	157.5	180
111	576.9	473.0	198.0	14.2	0.0	0.0	0.0	0.0	0.0
112	556.3	448.8	191.2	5.6	0.0	0.0	0.0	0.0	0.0
113	534.1	408.8	191.0	0.9	0.0	0.0	0.0	0.0	0.0
114	513.3	333.6	180.6	0.2	0.0	0.0	0.0	0.0	0.0
115	481.4	242.5	166.1	0.0	0.0	0.0	0.0	0.0	0.0
116	406.6	180.5	151.6	0.0	0.0	0.0	0.0	0.0	0.0
117	303.8	178.1	137.5	0.0	0.0	0.0	0.0	0.0	0.0
118	211.1	205.5	123.7	0.0	0.0	0.0	0.0	0.0	0.0
119	184.7	235.9	109.9	0.0	0.0	0.0	0.0	0.0	0.0
120	207.7	239.0	96.2	0.0	0.0	0.0	0.0	0.0	0.0
121	253.4	225.0	82.0	0.0	0.0	0.0	0.0	0.0	0.0
122	284.4	209.0	67.1	0.0	0.0	0.0	0.0	0.0	0.0
123	271.6	192.0	46.2	0.0	0.0	0.0	0.0	0.0	0.0
124	253.8	175.2	27.5	0.0	0.0	0.0	0.0	0.0	0.0
125	234.4	158.6	18.6	0.0	0.0	0.0	0.0	0.0	0.0
126	213.3	141.2	10.8	0.0	0.0	0.0	0.0	0.0	0.0
127	193.3	124.1	4.4	0.0	0.0	0.0	0.0	0.0	0.0
128	174.5	106.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
129	154.7	88.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130	134.0	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
131	114.9	37.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132	95.4	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
133	66.2	15.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
134	35.4	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	23.4	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
136	14.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
138	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
139	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
141	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
142	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
143	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
144	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
145	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Candela Tabulations (Continued)

	0	22.5	45	67.5	90	112.5	135	157.5	180
148	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
149	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
151	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
153	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
154	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
156	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
157	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0
158	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0
159	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0
160	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.0
161	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0	0.0
162	0.0	0.0	0.0	0.1	0.6	0.5	0.0	0.0	0.0
163	0.0	0.0	0.0	0.1	0.7	0.6	0.0	0.0	0.0
164	0.0	0.0	0.0	0.2	0.8	0.7	0.0	0.0	0.0
165	0.0	0.0	0.0	0.3	0.8	0.8	0.0	0.0	0.0
166	0.0	0.0	0.0	0.3	0.9	0.8	0.1	0.0	0.0
167	0.0	0.0	0.0	0.4	1.0	0.9	0.1	0.0	0.0
168	0.0	0.0	0.0	0.5	1.0	1.0	0.2	0.0	0.0
169	0.0	0.0	0.0	0.5	1.1	1.0	0.2	0.0	0.0
170	0.0	0.0	0.0	0.6	1.1	1.0	0.2	0.0	0.0
171	0.0	0.0	0.0	0.6	1.1	1.0	0.3	0.0	0.0
172	0.0	0.0	0.0	0.6	1.2	1.0	0.3	0.0	0.0
173	0.0	0.0	0.0	0.7	1.2	1.0	0.3	0.0	0.0
174	0.0	0.0	0.0	0.8	1.2	1.1	0.3	0.0	0.0
175	0.0	0.0	0.0	0.8	1.2	1.1	0.3	0.0	0.0
176	0.0	0.0	0.0	0.8	1.3	1.1	0.3	0.0	0.0
177	0.0	0.0	0.0	0.9	1.3	1.1	0.3	0.0	0.0
178	0.0	0.0	0.1	0.9	1.3	1.0	0.3	0.0	0.0
179	0.0	0.0	0.1	1.0	1.3	1.0	0.2	0.0	0.0
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Integrating Sphere Equipment List

Description	Manufacturer	Model	Serial Number
3M Sphere	Labsphere	ILLUMIA PLUS 3020-300 4PI	1109184535
CCD Array Spectrometer	Labsphere	MC-9801:3683L	98011077
Programmable AC Source	Chroma	61602	616020003699
Power Analyzer	Xitron	XT2640	264AD2006001

Goniophotometer Equipment List

Description	Manufacturer	Model	Serial Number
AC Power Source	Chroma	61602	616020002300
Type C Goniophotometer	LSI / UL	6440T	6440PN2028
Spectroradiometer	Gooch & Housego	770VIS/NIR	12415189
Spectrometer	Inphora, Inc	PDET 31	130627
Power Meter	Xitron	XT2640	M20140823

Test Methods Used:

Title	Description
ANSI C82.77:2002	Harmonic Emission Limits- Related Power Quality Reqt's for Lighting Equipment
CIE Pub. 13.3:1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. 15:2004	Colorimetry
IES LM-58:1994	Spectroradiometric Measurements
IES LM-79:2008	Electrical and Photometric Measurements of Solid-State Lighting Products

Reference Standard Used:

Equipment	Description
3m Sphere	Tungsten Halogen Omni-Directional 35W Calibration Lamp, Serial Number E4
Type C Goniophotometer and Spectrometer	Tungsten Halogen Omni-Directional 500W Calibration Lamp, Serial Numbers 16C293, 16C294, 16C295. For color calibration of spectrometer, 13C074.

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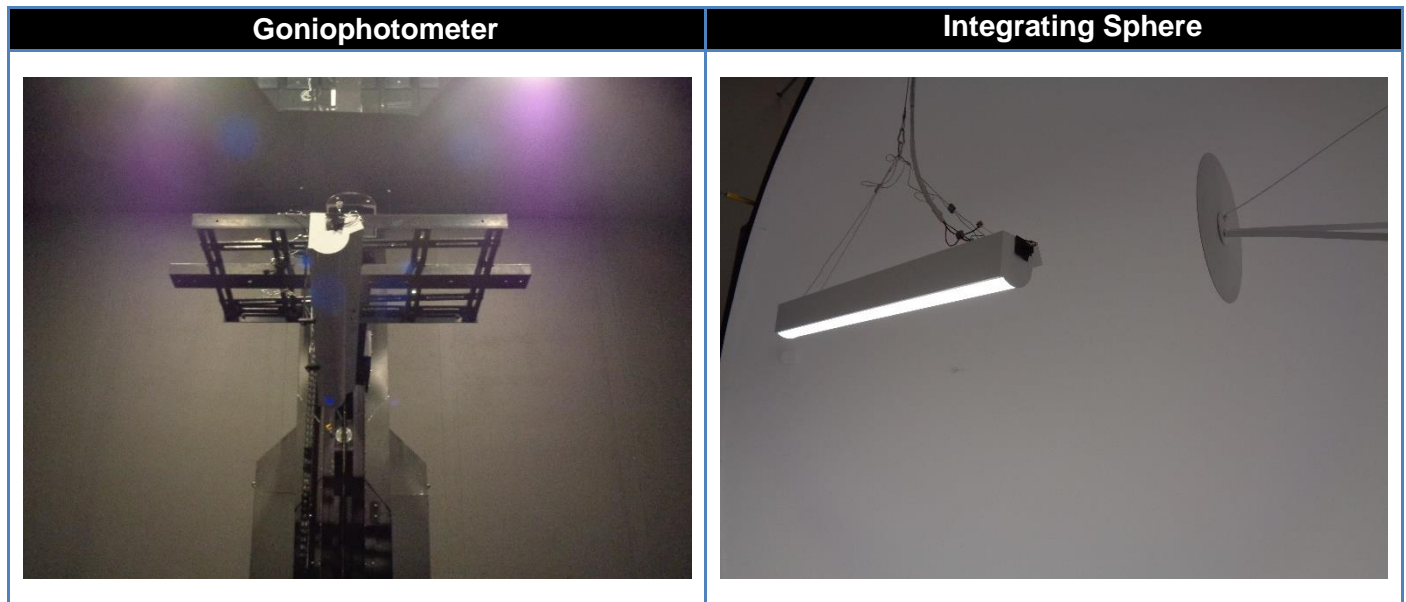
In the event that the recorded temperature is outside of $25 \pm 1^{\circ}\text{C}$, this is considered a non-standard condition.

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In the event that testing is subcontracted, or subcontracted equipment was used, test results in this report marked with the symbol *, or noted as "Sphere" or "Integrating Sphere" or "Goniophotometer," were performed by the subcontracted laboratory identified in the equipment list of this report.

Additional Comments:

The photos below are intended to show the orientation and fixturing/set-up of the units under test. These are critical to understanding the results of the test given the sensitivity of many products and measurement systems to orientation and set-up considerations, and also for reproducing the conditions of the test.



Document Revision History:

Each subsequent revision of this report replaces the preceding report.

Date	Rev	DCN #	Change at the time of this test	By	Approval
07/13/2022	A	DMS	Origination	M.Hubbard	J. Vollers