

**Report Number:** PL16874-003B  
**Model:** C-SW-A-S66L-SCCT-US-UC-WH (55W/5000K)  
**Date:** 07/13/2022

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

**Prepared For:**

Tammy Lehrmann

Cree Lighting

9201 Washington Avenue

Racine, WI 53406

**Prepared By:**



Meranda Hubbard, Photometric Test Technician

**Approved By:**



Jonathan Vollers, Technical Manager

### Product Information

<b>Manufacturer</b>	Cree Lighting
<b>Model Number (SKU)</b>	C-SW-A-S66L-SCCT-US-UC-WH (55W/5000K)
<b>Serial Number</b>	16874-003
<b>LED Type</b>	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	7236.3	7049	lm
Efficacy	116.77	114.56	lm/W
Correlated Color Temperature (CCT)	5106	K	
Color Rendering Index (CRI)	84		
R <sub>9</sub>	17		
Duv	0.0016		
S/P Ratio*	2.03		
CIE Type	Direct		

	Sphere		Goniophotometer		
Electrical Measurements	120V	277V	120V	277V	
Input Wattage	61.97	62.84	61.53	61.06	W
Input Current	0.526	0.250	0.522	0.241	A
Input Voltage	120.15	277.06	120.12	277.17	V
Power Factor	0.980	0.908	0.982	0.915	
Off-State Power	0	0	0	0	W
Total Harmonic Distortion (Voltage)	0.07	0.07	0.07	0.07	%
Total Harmonic Distortion (Amperage)	15.26	22.76	15.39	23.54	%

**Note:** All photometric measurements taken at 120VAC.

Key Test Parameters	Sphere Output	Goniophotometer	
Stabilization Time	59	30	min
Total Operating Time (Stabilization + Test)	69	50	min
Ambient Temperature	24.60	24.8	°C

### Spacing Criteria

Spacing Criterion (0 - 180)	1.66
Spacing Criterion (90 - 270)	1.24
Spacing Criterion (Diagonal)	1.40

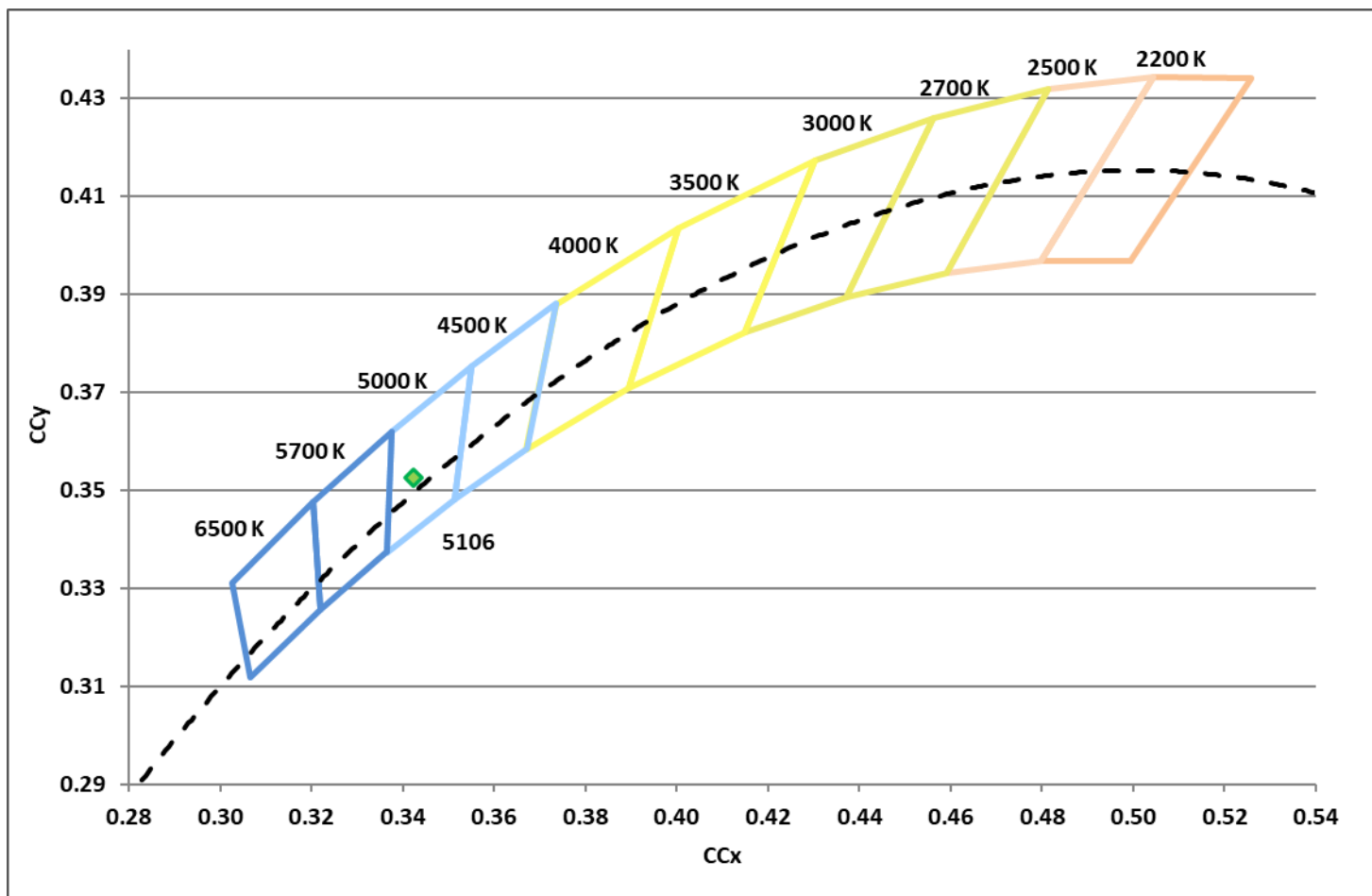
### Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.3424	0.3526	0.2093	0.3232	0.2093	0.4848	0.0016

### Color Rendering Index Details

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
84	84	93	95	79	82	87	85	68	17	80	77	57	87	98

### Chromaticity Diagram



**Spectral Distribution**

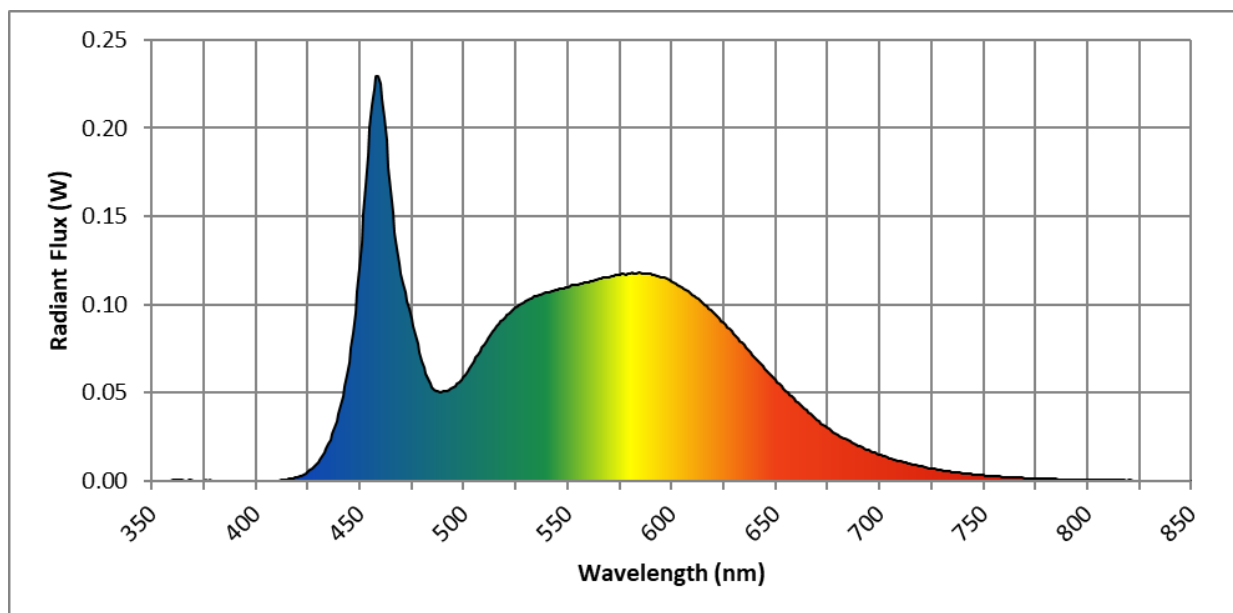
$\lambda(\text{nm})$	W/nm
360	0.000390
370	0.000260
380	0.000186
390	0.000050
400	0.000018
410	0.000241
420	0.002280
430	0.010735
440	0.038253
450	0.120696
460	0.225009
470	0.117278
480	0.067784
490	0.050663
500	0.058717
510	0.077324
520	0.092985

$\lambda(\text{nm})$	W/nm
530	0.102188
540	0.106681
550	0.109980
560	0.112699
570	0.115646
580	0.117330
590	0.117205
600	0.113008
610	0.105734
620	0.095622
630	0.083461
640	0.070197
650	0.057309
660	0.045577
670	0.034885
680	0.026377
690	0.020135

$\lambda(\text{nm})$	W/nm
700	0.015121
710	0.011258
720	0.008351
730	0.006134
740	0.004431
750	0.003267
760	0.002399
770	0.001740
780	0.001234
790	0.000911
800	0.000626
810	0.000493
820	0.000335
830	0.000238

<b>Dominant Wavelength</b>	569	nm
<b>Peak Wavelength</b>	459	nm

**Spectral Power Distribution (W/nm)**



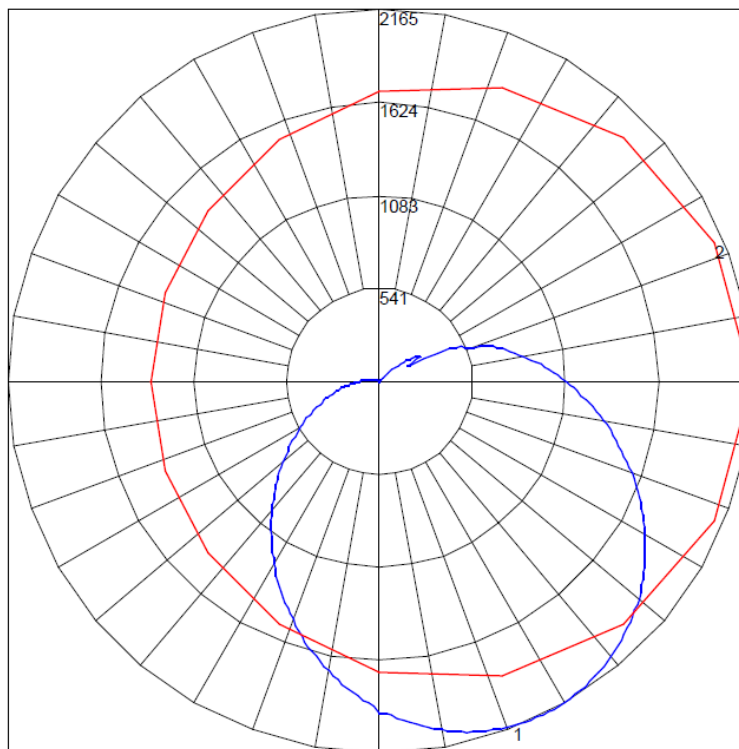
**Zonal Lumen Summary**

Zone	Lumens	% of Total	Zone	Lumens
0-20	707.62	10	0-10	183.02
0-30	1505.14	21.4	10-20	524.60
0-40	2475.66	35.1	20-30	797.52
0-60	4485.37	63.6	30-40	970.52
0-80	5978.17	84.8	40-50	1029.50
0-90	6434.12	91.3	50-60	980.21
10-90	6251.1	88.7	60-70	842.11
20-40	1768.05	25.1	70-80	650.68
20-50	2797.54	39.7	80-90	455.95
40-70	2851.82	40.5	90-100	307.64
60-80	1492.79	21.2	100-110	191.08
70-80	650.68	9.2	110-120	79.56
80-90	455.95	6.5	120-130	33.14
90-110	498.72	7.1	130-140	3.83
90-120	578.28	8.2	140-150	0.00
90-130	611.42	8.7	150-160	0.01
90-150	615.25	8.7	160-170	0.07
90-180	615.38	8.7	170-180	0.04
110-180	116.66	1.7		
<b>Total</b>	<b>7049.5</b>	<b>100</b>		

**Luminance Data (Cd./Sq.M)**

Average in Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	15540	14430	13448
55	15482	13961	12395
65	15511	13467	10823
75	15739	13169	8203
85	16622	13492	3012

### Candela Plots



Maximum Candela = 2165.18 Located At Horizontal Angle = 0, Vertical Angle = 26  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)  
# 2 - Horizontal Cone Through Vertical Angle (26) (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	100	100	100	94	94	94	91
1	104	99	93	89	101	95	91	86	89	86	82	84	81	78	79	76	74	71
2	94	85	77	71	90	82	75	69	77	71	66	72	68	63	68	64	61	58
3	85	74	65	58	82	72	63	57	67	60	55	63	57	52	60	55	50	48
4	78	65	56	48	75	63	54	48	59	52	46	56	50	44	53	47	43	40
5	71	58	48	41	69	56	47	41	53	45	39	50	43	38	47	42	37	35
6	66	52	43	36	63	50	42	35	48	40	34	45	38	33	43	37	32	30
7	61	47	38	32	59	46	37	31	43	36	30	41	34	29	39	33	29	26
8	57	43	34	28	55	42	33	28	40	32	27	38	31	26	36	30	26	23
9	53	39	31	25	51	38	30	25	36	29	24	35	28	24	33	27	23	21
10	50	36	28	23	48	35	28	22	34	27	22	32	26	21	31	25	21	19

### Candela Tabulations

	0	22.5	45	67.5	90	112.5	135	157.5	180
0	1934.9	1934.9	1934.9	1934.9	1934.9	1934.9	1934.9	1934.9	1934.9
1	1934.3	1937.1	1939.7	1955.8	1966.4	1941.8	1913.9	1904.2	1899.0
2	1951.2	1952.4	1951.0	1961.3	1965.5	1933.3	1900.3	1886.8	1880.3
3	1967.3	1967.2	1962.0	1966.1	1962.7	1924.6	1885.6	1868.9	1861.2
4	1982.3	1981.4	1972.1	1969.8	1959.9	1914.9	1870.7	1850.3	1840.4
5	1997.7	1995.3	1981.1	1972.7	1955.7	1904.5	1855.3	1831.9	1821.0
6	2011.9	2007.8	1989.5	1974.9	1950.8	1893.1	1839.1	1813.3	1800.4
7	2026.1	2020.4	1997.3	1976.7	1945.6	1881.7	1822.9	1793.7	1780.0
8	2039.2	2031.7	2004.3	1976.9	1939.1	1869.1	1805.5	1773.8	1759.1
9	2052.4	2042.5	2010.6	1977.2	1931.9	1855.7	1787.9	1753.4	1737.3
10	2065.1	2052.3	2016.1	1976.4	1924.2	1841.4	1769.3	1732.4	1715.9
11	2077.2	2061.6	2021.3	1974.4	1915.7	1826.9	1750.7	1711.5	1693.7
12	2088.7	2071.0	2025.3	1971.6	1905.6	1811.4	1731.4	1689.6	1671.0
13	2098.9	2079.3	2028.8	1968.5	1894.7	1794.9	1711.4	1667.3	1648.2
14	2108.5	2086.5	2031.5	1965.3	1884.0	1777.8	1690.2	1645.2	1625.4
15	2117.2	2093.4	2033.4	1960.3	1872.3	1760.0	1668.7	1622.5	1601.9
16	2125.7	2099.5	2034.3	1954.7	1859.4	1741.7	1647.0	1598.8	1577.7
17	2133.0	2104.5	2034.7	1948.5	1846.0	1723.0	1624.7	1575.1	1553.8
18	2140.0	2108.4	2033.9	1941.4	1831.8	1703.4	1602.0	1552.0	1529.1
19	2145.6	2112.3	2032.5	1933.5	1816.9	1683.0	1579.1	1528.1	1504.1
20	2150.1	2115.0	2030.3	1925.1	1801.4	1662.3	1555.8	1504.6	1479.2
21	2154.2	2117.3	2027.6	1916.0	1785.2	1641.1	1532.9	1480.2	1454.6
22	2157.7	2117.8	2024.0	1905.8	1768.5	1619.8	1509.0	1456.0	1430.5
23	2160.0	2118.0	2019.5	1895.0	1751.1	1597.5	1485.2	1431.1	1406.2
24	2163.0	2117.5	2014.3	1883.3	1733.2	1574.6	1461.1	1406.8	1381.4
25	2164.3	2117.0	2008.2	1871.0	1714.1	1551.8	1436.0	1381.7	1356.5
26	2165.2	2115.6	2002.0	1857.8	1695.0	1528.2	1411.7	1356.7	1331.8
27	2165.1	2113.7	1994.9	1843.9	1674.2	1503.5	1385.9	1331.3	1306.3
28	2164.1	2110.8	1986.5	1829.7	1653.3	1478.9	1360.4	1306.1	1281.0
29	2162.6	2107.2	1977.7	1814.3	1631.8	1454.4	1333.6	1280.3	1255.6
30	2160.6	2102.5	1968.0	1798.0	1609.9	1429.3	1308.2	1254.6	1229.9
31	2157.4	2097.5	1958.0	1782.2	1587.3	1404.0	1282.1	1228.4	1203.8
32	2154.0	2091.0	1946.8	1765.1	1564.1	1378.6	1255.5	1203.2	1177.8
33	2149.0	2084.7	1934.8	1747.3	1541.0	1352.7	1228.9	1177.4	1152.6
34	2143.7	2077.3	1922.7	1729.0	1517.4	1326.7	1202.7	1152.1	1127.2
35	2136.8	2069.0	1910.0	1710.2	1493.3	1300.1	1176.7	1126.9	1102.0
36	2129.8	2059.5	1896.1	1691.4	1469.0	1272.8	1150.0	1101.4	1076.9

**Candela Tabulations (Continued)**

	0	22.5	45	67.5	90	112.5	135	157.5	180
37	2122.2	2049.8	1882.1	1671.6	1443.9	1245.2	1123.4	1076.3	1051.9
38	2114.3	2039.4	1866.9	1651.6	1418.1	1217.4	1097.5	1051.3	1027.0
39	2105.9	2028.6	1851.5	1630.4	1392.3	1188.9	1070.9	1026.1	1001.8
40	2096.6	2017.3	1835.7	1609.0	1365.9	1160.6	1043.8	1000.6	977.3
41	2085.3	2005.0	1819.1	1587.3	1338.3	1131.5	1017.1	975.4	952.6
42	2074.7	1992.2	1801.8	1564.8	1311.2	1102.4	990.0	950.4	928.7
43	2063.0	1978.7	1783.7	1542.0	1283.1	1074.1	963.1	925.0	902.2
44	2051.3	1964.8	1765.4	1518.3	1254.9	1045.9	936.3	898.1	877.7
45	2039.5	1950.5	1746.4	1494.7	1226.7	1017.4	908.1	873.3	854.5
46	2027.1	1936.0	1727.4	1470.5	1198.4	988.7	879.8	849.7	830.9
47	2014.0	1920.8	1707.6	1445.7	1169.8	960.3	853.9	826.4	808.4
48	2000.0	1905.1	1688.1	1420.6	1141.4	931.9	828.1	803.2	785.6
49	1986.2	1889.0	1667.6	1395.6	1112.0	900.0	803.0	780.4	762.7
50	1970.9	1872.0	1646.4	1370.2	1083.3	870.7	777.3	757.7	740.2
51	1954.9	1853.9	1624.8	1344.5	1054.0	841.9	752.4	735.3	718.3
52	1938.3	1835.6	1602.5	1318.5	1024.4	812.6	728.2	712.8	696.5
53	1920.2	1816.7	1579.9	1292.1	994.4	783.3	703.9	690.7	674.2
54	1901.9	1797.1	1556.6	1264.6	963.7	754.4	679.5	668.8	654.2
55	1882.9	1776.7	1532.7	1237.0	932.8	725.4	655.5	647.4	633.2
56	1863.9	1757.1	1508.7	1209.2	898.6	696.7	631.4	626.1	612.4
57	1844.0	1735.6	1483.9	1180.7	867.0	668.4	607.4	604.7	592.2
58	1824.7	1714.4	1458.8	1152.1	835.7	640.1	584.2	584.0	572.5
59	1805.0	1693.1	1434.0	1123.8	804.3	612.2	561.0	563.3	552.3
60	1785.5	1671.6	1408.9	1094.7	772.9	584.5	538.2	542.8	532.5
61	1764.7	1649.9	1383.2	1065.5	741.7	557.2	516.2	522.7	514.2
62	1743.8	1628.3	1358.5	1036.8	710.4	530.1	495.0	503.3	495.1
63	1722.0	1606.4	1333.5	1007.9	679.1	503.1	473.8	484.0	476.9
64	1701.4	1583.6	1307.9	978.4	648.0	477.0	453.4	465.6	459.3
65	1680.0	1560.8	1282.2	949.4	617.0	450.7	433.2	447.1	441.9
66	1657.3	1538.0	1256.8	919.9	585.7	424.6	413.0	429.2	424.0
67	1634.4	1514.7	1230.6	887.0	553.7	399.0	392.9	411.0	407.6
68	1611.3	1490.3	1204.3	857.1	522.0	374.2	373.7	393.9	391.9
69	1586.9	1466.3	1178.4	827.3	489.8	349.5	354.2	376.4	375.3
70	1562.4	1441.5	1151.7	797.5	457.9	325.7	335.2	359.8	360.2
71	1538.1	1416.9	1125.9	767.0	426.0	302.7	317.1	343.5	345.3
72	1513.5	1392.1	1100.0	737.1	394.9	280.2	299.4	327.6	330.5
73	1490.6	1368.2	1074.2	707.5	363.8	258.6	282.0	312.1	315.9

**Candela Tabulations (Continued)**

	0	22.5	45	67.5	90	112.5	135	157.5	180
74	1467.2	1343.5	1048.3	677.8	333.5	238.0	265.8	297.4	302.3
75	1443.3	1319.1	1023.8	649.0	303.7	218.2	250.0	283.0	288.6
76	1420.0	1296.3	999.1	621.1	274.7	199.0	234.3	269.0	274.9
77	1396.9	1271.9	974.5	592.8	245.8	180.8	219.7	255.4	261.5
78	1373.7	1247.8	950.3	565.9	217.6	163.4	205.4	242.0	248.5
79	1349.3	1224.5	926.6	539.6	190.0	146.5	191.1	228.8	235.2
80	1326.0	1200.7	900.5	513.6	162.9	130.7	177.6	215.8	222.3
81	1301.2	1175.9	874.9	487.7	136.5	115.8	164.4	203.1	210.2
82	1277.0	1152.5	851.7	463.0	111.7	101.5	151.3	190.4	198.0
83	1251.8	1128.3	828.0	438.7	88.3	88.2	138.9	178.1	186.0
84	1227.5	1102.6	804.0	414.9	67.0	75.7	127.2	166.5	175.2
85	1201.9	1078.6	781.4	392.2	47.9	64.1	115.5	154.8	164.6
86	1177.7	1054.8	758.6	370.5	31.6	53.3	104.4	144.0	153.8
87	1153.9	1029.6	735.6	349.1	18.1	43.7	94.7	133.8	144.0
88	1129.9	1006.7	714.3	329.6	8.0	35.1	85.0	123.8	134.0
89	1106.6	984.5	693.6	311.2	1.7	27.6	75.8	114.0	123.8
90	1083.7	960.6	672.3	293.1	0.0	20.9	66.9	104.4	114.0
91	1060.2	938.2	652.5	276.1	0.0	15.2	58.5	94.9	104.1
92	1036.9	916.8	632.7	260.2	0.0	10.5	50.4	85.6	94.3
93	1013.8	890.1	612.6	244.5	0.0	6.8	43.2	76.9	85.3
94	990.4	867.7	592.6	229.5	0.0	3.5	36.6	68.5	76.7
95	966.3	845.6	573.4	215.4	0.0	0.6	30.1	60.4	68.1
96	943.3	823.1	553.6	201.7	0.0	0.0	23.9	52.7	60.1
97	919.8	800.4	534.4	188.6	0.0	0.0	18.3	45.2	52.4
98	892.9	779.0	515.9	176.8	0.0	0.0	12.7	37.8	44.7
99	870.4	757.0	497.3	165.2	0.0	0.0	8.0	30.8	37.3
100	847.3	734.9	478.7	153.6	0.0	0.0	3.8	24.4	30.6
101	824.3	713.6	461.2	143.0	0.0	0.0	0.6	18.1	23.9
102	801.9	692.5	443.9	130.8	0.0	0.0	0.0	12.5	17.6
103	779.3	670.9	424.9	115.1	0.0	0.0	0.0	7.4	11.9
104	757.3	650.2	403.7	98.6	0.0	0.0	0.0	2.8	6.4
105	736.4	629.5	379.8	83.5	0.0	0.0	0.0	0.0	2.0
106	714.8	601.6	353.3	69.4	0.0	0.0	0.0	0.0	0.0
107	692.8	565.3	324.1	56.9	0.0	0.0	0.0	0.0	0.0
108	663.6	524.6	289.0	45.7	0.0	0.0	0.0	0.0	0.0
109	625.5	490.8	242.8	35.0	0.0	0.0	0.0	0.0	0.0
110	582.0	466.3	197.8	24.8	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	551.0	444.7	178.9	16.4	0.0	0.0	0.0	0.0	0.0
112	531.0	419.9	173.5	8.7	0.0	0.0	0.0	0.0	0.0
113	510.4	377.1	172.6	2.2	0.0	0.0	0.0	0.0	0.0
114	489.1	305.7	162.7	0.0	0.0	0.0	0.0	0.0	0.0
115	454.2	221.6	150.4	0.0	0.0	0.0	0.0	0.0	0.0
116	382.4	168.4	137.8	0.0	0.0	0.0	0.0	0.0	0.0
117	287.1	170.3	126.3	0.0	0.0	0.0	0.0	0.0	0.0
118	198.9	195.3	115.0	0.0	0.0	0.0	0.0	0.0	0.0
119	181.6	222.8	103.6	0.0	0.0	0.0	0.0	0.0	0.0
120	206.3	225.0	92.3	0.0	0.0	0.0	0.0	0.0	0.0
121	247.2	211.8	80.6	0.0	0.0	0.0	0.0	0.0	0.0
122	275.7	197.7	66.0	0.0	0.0	0.0	0.0	0.0	0.0
123	263.5	182.7	44.5	0.0	0.0	0.0	0.0	0.0	0.0
124	247.1	168.5	29.4	0.0	0.0	0.0	0.0	0.0	0.0
125	229.6	153.9	21.7	0.0	0.0	0.0	0.0	0.0	0.0
126	211.4	139.1	14.6	0.0	0.0	0.0	0.0	0.0	0.0
127	193.4	123.8	8.3	0.0	0.0	0.0	0.0	0.0	0.0
128	176.2	108.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0
129	157.8	91.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130	139.1	64.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
131	121.0	40.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
132	99.3	29.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
133	65.9	21.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
134	39.1	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
135	30.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
136	21.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
137	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
138	5.4	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	0.1	0.0	0.0	0.0
157	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0
158	0.0	0.0	0.0	0.0	0.3	0.3	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	0.1	0.6	0.5	0.0	0.0	0.0
162	0.0	0.0	0.0	0.2	0.7	0.6	0.0	0.0	0.0
163	0.0	0.0	0.0	0.2	0.7	0.7	0.0	0.0	0.0
164	0.0	0.0	0.0	0.3	0.8	0.8	0.0	0.0	0.0
165	0.0	0.0	0.0	0.4	0.9	0.9	0.1	0.0	0.0
166	0.0	0.0	0.0	0.4	0.9	0.9	0.1	0.0	0.0
167	0.0	0.0	0.0	0.5	1.0	1.0	0.2	0.0	0.0
168	0.0	0.0	0.0	0.6	1.0	1.0	0.2	0.0	0.0
169	0.0	0.0	0.0	0.6	1.1	1.0	0.2	0.0	0.0
170	0.0	0.0	0.0	0.6	1.1	1.0	0.3	0.0	0.0
171	0.0	0.0	0.0	0.7	1.2	1.0	0.3	0.0	0.0
172	0.0	0.0	0.0	0.7	1.2	1.0	0.3	0.0	0.0
173	0.0	0.0	0.0	0.8	1.2	1.0	0.3	0.0	0.0
174	0.0	0.0	0.0	0.8	1.2	1.1	0.4	0.0	0.0
175	0.0	0.0	0.0	0.8	1.3	1.1	0.4	0.0	0.0
176	0.0	0.0	0.1	0.9	1.3	1.1	0.4	0.0	0.0
177	0.0	0.0	0.1	0.9	1.3	1.1	0.4	0.0	0.0
178	0.0	0.0	0.2	1.0	1.3	1.1	0.3	0.0	0.0
179	0.0	0.0	0.2	1.0	1.3	1.0	0.3	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.

### Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

The results contained in this report pertain only to the tested sample.

This report shall not be reproduced, except in full, without written approval of the RESTL.

\*Items marked with a single asterisk are not covered by the NVLAP accreditation.

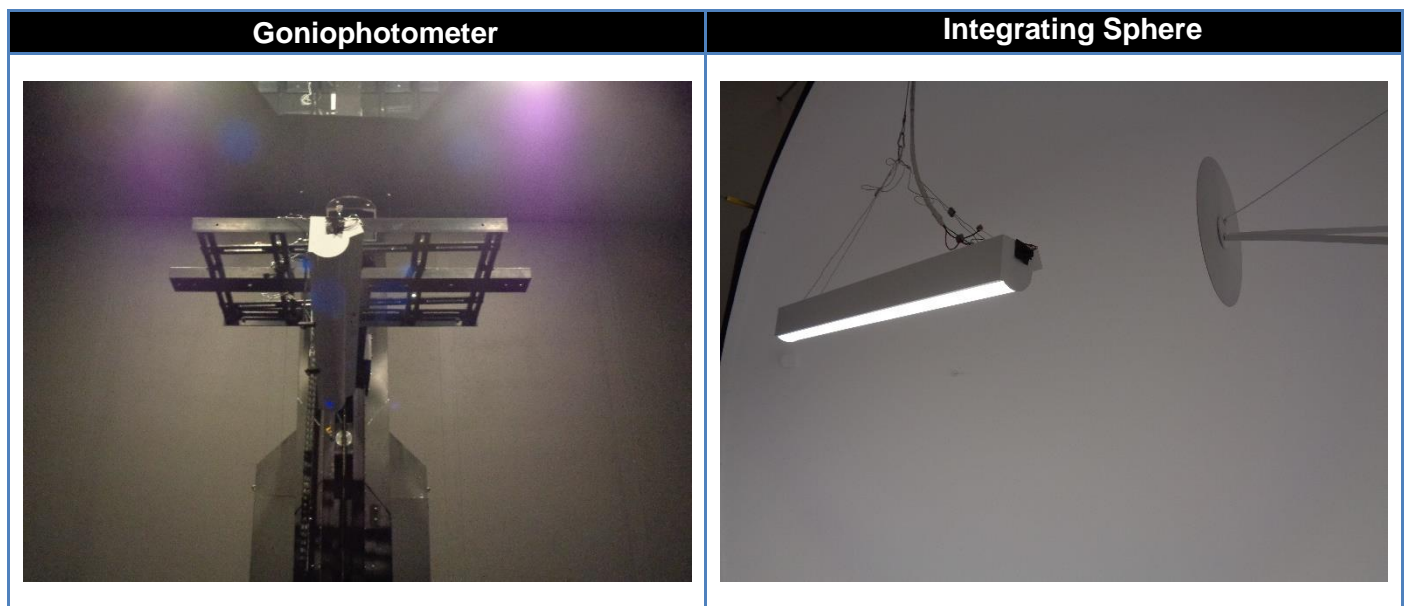
In the event that the recorded temperature is outside of  $25 \pm 1^{\circ}\text{C}$ , this is considered a non-standard condition.

This report may contain data not covered by the NVLAP accreditation, and are identified with \*\*.

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
08/04/2022	B	DMS	PF/THD where found to be in error. Sphere testing re-conducted and data updated in Rev. B	M.Hubbard	J. Vollers