

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

Brand: HALO COMMERCIAL

Report Number: P776446

Luminaire Tested: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

Issue Date: 2/13/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P776446  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA ( A2312156B048)  
Test Lab:  
Issue Date: 2/13/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO COMMERCIAL  
Catalog Number: HCDJBS3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K  
Description: 8 INCH ROUND SHALLOW-WIDE LENSED WALLWASH KIT  
Light Source: SELECTABLE LUMENS AND CCT ARRAY 90CRI / 3000K CCT  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4803.7 lumens  
Efficiency: N/A  
Efficacy: 124.8 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.17 / 1.27  
Luminous Opening: Circular (Dia: 0.67' x H: 0')  
CIE Type: Direct

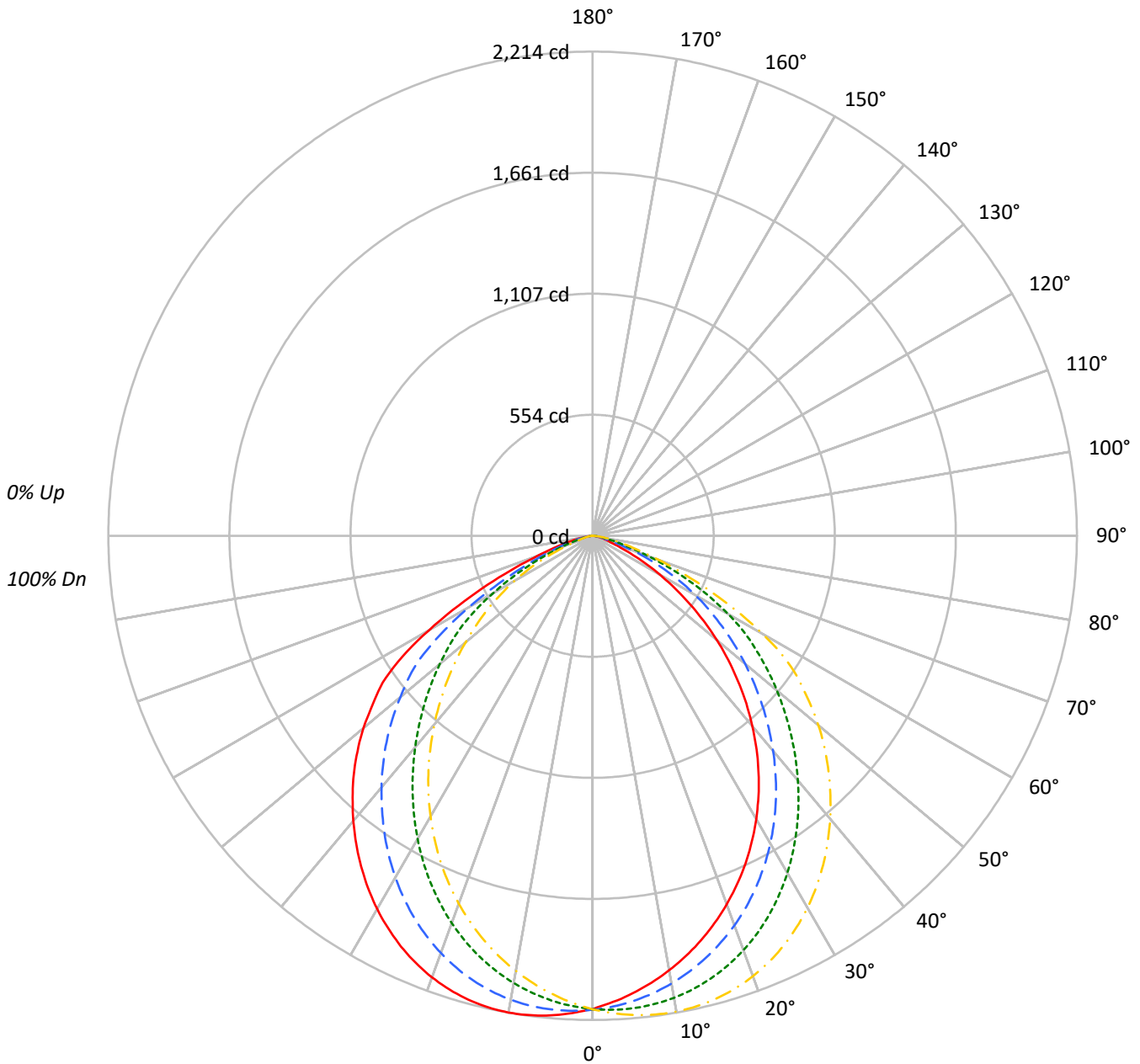
Input Watts (W): 38.5  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT



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### Luminous Intensity Polar Plot





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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

RF	20					20					20					20										
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	50	30	10	0					
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100								
1	111	107	103	100	108	105	101	98	100	98	95	97	94	92	93	91	90	88								
2	102	95	89	84	100	93	88	83	90	85	81	86	83	79	83	80	78	76								
3	94	85	77	72	92	83	76	71	80	74	70	77	73	69	75	71	67	65								
4	87	76	68	62	84	74	67	61	72	66	61	70	64	60	68	63	59	57								
5	80	68	60	54	78	67	59	54	65	58	53	63	57	52	61	56	52	50								
6	74	62	53	48	72	61	53	47	59	52	47	57	51	47	56	50	46	44								
7	69	56	48	42	67	55	48	42	54	47	42	53	46	42	51	46	41	39								
8	64	52	44	38	63	51	43	38	50	43	38	48	42	37	47	42	37	35								
9	60	47	40	34	59	47	39	34	46	39	34	45	38	34	44	38	34	32								
10	56	44	36	31	55	43	36	31	42	36	31	41	35	31	41	35	31	29								

**AVERAGE LUMINANCE (cd/sqm):**

	0°	90°	180°	270°
0°	66104	66104	66104	66104
5°	64365	66452	67472	65397
10°	62536	66491	68627	64368
15°	60518	66208	69400	63003
20°	58264	65512	69798	61217
25°	55690	64382	69812	59002
30°	52735	62765	69460	56434
35°	49290	60684	68764	53476
40°	45267	58168	67824	50288
45°	40607	55326	66647	46911
50°	35152	52218	64914	43312
55°	28791	48666	62351	39330
60°	21579	43640	52793	32167
65°	13827	35145	38259	23016
70°	7829	24146	23655	13872
75°	5957	14132	14957	7526
80°	4202	7771	8527	3587
85°	2452	4239	2207	1506

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 157.5°  
 Vertical Angle: 45°  
 Luminance: 67580 cd/sqm



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	204.3	4.3
10°-20°	578.0	12.0
20°-30°	851.0	17.7
30°-40°	975.7	20.3
40°-50°	939.0	19.5
50°-60°	748.7	15.6
60°-70°	388.6	8.1
70°-80°	104.8	2.2
80°-90°	13.4	0.3
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	1633.3	34.0
0°-40°	2609.0	54.3
0°-60°	4296.8	89.4
0°-90°	4803.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4803.7	100.0

**CANDELA DISTRIBUTION:**

	0°	90°	180°	270°	360°	Flux
0°	2165	2165	2165	2165	2165	
5°	2100	2168	2202	2134	2100	198
15°	1915	2095	2196	1993	1915	538
25°	1653	1911	2072	1752	1653	760
35°	1322	1628	1845	1435	1322	825
45°	940	1281	1544	1086	940	723
55°	541	914	1171	739	541	484
65°	191	486	530	319	191	198
75°	50	120	127	64	50	55
85°	7	12	6	4	7	9
90°	0	1	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
0°	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2
0.5°	2157.3	2166.7	2166.0	2164.8	2166.0	2167.9	2169.1	2169.1	2167.5	2174.2	2169.5
1°	2151.9	2162.8	2163.6	2164.4	2167.5	2171.4	2173.8	2173.8	2172.2	2177.3	2171.4
1.5°	2146.0	2158.5	2160.9	2164.0	2168.3	2173.8	2177.7	2177.7	2176.9	2180.0	2172.6
2°	2140.1	2154.2	2158.1	2162.8	2169.1	2176.5	2181.6	2181.6	2181.2	2182.8	2173.8
2.5°	2133.9	2149.5	2154.6	2162.0	2169.5	2178.9	2185.5	2185.5	2185.1	2185.5	2174.6
3°	2127.6	2144.4	2151.5	2160.5	2169.9	2181.2	2189.0	2189.0	2188.7	2187.9	2175.0
3.5°	2121.3	2139.3	2147.9	2158.9	2169.9	2183.2	2192.2	2192.2	2192.6	2189.8	2175.3
4°	2114.3	2133.9	2144.0	2156.9	2169.5	2184.7	2194.9	2194.9	2195.7	2191.4	2175.3
4.5°	2107.6	2128.4	2139.7	2154.6	2169.1	2185.9	2197.7	2197.7	2198.8	2193.0	2175.0
5°	2100.2	2122.5	2135.4	2152.3	2168.3	2186.7	2200.0	2200.0	2201.6	2194.1	2174.6
5.5°	2093.2	2116.6	2131.1	2149.5	2167.1	2187.5	2202.0	2202.0	2203.9	2194.9	2173.4
6°	2085.3	2110.4	2126.0	2146.4	2166.0	2187.9	2203.9	2203.9	2206.3	2195.3	2172.6
6.5°	2077.5	2103.7	2120.9	2143.3	2164.0	2188.3	2205.5	2205.5	2208.2	2195.7	2171.4
7°	2069.7	2097.1	2115.9	2139.7	2162.0	2188.3	2207.0	2207.0	2209.8	2195.7	2169.9
7.5°	2061.4	2090.0	2110.4	2136.2	2159.7	2187.9	2207.8	2207.8	2211.0	2195.3	2167.9
8°	2052.8	2083.0	2104.5	2131.9	2157.7	2187.5	2208.6	2208.6	2212.1	2194.9	2165.6
8.5°	2044.2	2075.5	2098.2	2127.6	2155.0	2186.3	2209.4	2209.4	2212.9	2193.7	2163.2
9°	2035.2	2068.1	2092.0	2122.9	2151.9	2185.5	2209.4	2209.4	2213.7	2193.0	2160.5
9.5°	2026.6	2060.3	2085.7	2118.2	2148.7	2184.0	2209.4	2209.4	2213.7	2191.4	2157.3
10°	2017.2	2052.4	2078.7	2113.1	2144.8	2182.0	2209.0	2220.0	2213.7	2189.4	2154.2
10.5°	2008.2	2044.2	2071.6	2107.6	2141.3	2180.4	2208.6	2219.6	2212.9	2187.5	2150.7
11°	1998.4	2035.6	2064.6	2101.8	2137.0	2178.1	2207.4	2219.2	2212.1	2185.1	2146.8
11.5°	1988.7	2027.4	2057.1	2096.3	2132.7	2175.7	2206.3	2218.4	2211.4	2182.8	2142.5
12°	1978.5	2018.4	2049.7	2090.0	2128.0	2173.0	2205.1	2217.6	2209.8	2179.6	2138.2
12.5°	1968.7	2009.4	2041.5	2083.4	2123.3	2169.9	2203.1	2216.0	2208.2	2176.5	2133.5
13°	1958.1	2000.0	2033.7	2076.7	2118.2	2166.7	2201.2	2214.5	2206.3	2173.0	2128.4
13.5°	1947.6	1990.6	2025.1	2070.1	2112.7	2163.2	2198.8	2212.5	2204.3	2169.5	2123.3
14°	1937.0	1981.2	2016.4	2062.6	2106.9	2159.3	2196.1	2210.6	2202.0	2165.2	2117.4
14.5°	1925.6	1971.4	2007.8	2055.6	2101.0	2155.0	2193.3	2208.2	2198.8	2160.9	2111.9
15°	1914.7	1961.6	1998.8	2047.8	2094.7	2150.3	2190.2	2205.1	2195.7	2156.2	2105.7
15.5°	1903.3	1951.1	1989.4	2039.9	2088.1	2146.0	2186.7	2202.0	2192.2	2151.5	2099.4
16°	1892.0	1940.5	1979.6	2031.7	2081.0	2140.9	2182.8	2198.8	2188.7	2146.0	2093.2
16.5°	1880.2	1929.9	1969.9	2023.1	2074.0	2135.4	2178.9	2194.9	2184.7	2140.5	2086.1
17°	1868.1	1919.0	1960.1	2014.1	2066.5	2129.9	2174.6	2191.0	2180.4	2134.6	2078.7
17.5°	1856.0	1908.0	1949.9	2005.5	2059.1	2124.1	2169.9	2186.7	2175.7	2128.4	2071.2
18°	1844.2	1896.7	1939.7	1996.1	2050.9	2117.8	2165.2	2182.0	2170.6	2122.1	2063.4
18.5°	1831.7	1885.3	1928.8	1986.7	2042.7	2111.2	2160.1	2177.3	2165.2	2115.5	2055.6
19°	1818.4	1873.6	1917.8	1976.9	2034.1	2104.9	2154.6	2172.2	2160.1	2108.8	2047.4
19.5°	1805.9	1861.4	1906.9	1966.7	2025.4	2097.8	2148.7	2166.7	2154.2	2101.4	2038.7
20°	1793.3	1849.7	1895.5	1956.9	2016.4	2090.4	2142.9	2160.9	2148.3	2093.9	2029.7
20.5°	1780.0	1837.2	1884.2	1946.4	2006.7	2083.0	2136.6	2155.0	2142.1	2086.1	2021.1
21°	1766.0	1825.1	1872.4	1935.8	1997.3	2075.1	2129.9	2148.7	2135.4	2078.3	2011.7



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
22.5°	1725.6	1786.3	1835.6	1901.8	1967.1	2050.1	2108.4	2128.0	2113.5	2052.8	1982.4
23°	1711.5	1773.0	1823.1	1890.0	1956.6	2041.1	2100.6	2120.9	2105.7	2043.4	1971.8
23.5°	1697.1	1759.7	1810.2	1878.3	1945.2	2032.1	2092.8	2113.1	2097.8	2034.4	1961.6
24°	1682.6	1746.0	1796.9	1866.1	1934.2	2022.3	2084.5	2105.3	2089.6	2024.7	1950.7
24.5°	1668.1	1732.3	1783.6	1853.2	1922.9	2012.5	2075.9	2097.1	2081.0	2014.9	1939.7
25°	1653.2	1718.2	1770.3	1840.7	1911.2	2002.7	2066.9	2088.5	2072.4	2004.7	1928.4
25.5°	1638.4	1703.7	1756.6	1827.8	1899.0	1992.2	2057.9	2079.8	2063.0	1994.5	1917.0
26°	1623.1	1689.6	1742.5	1814.5	1886.9	1981.6	2048.5	2070.8	2053.6	1984.0	1905.3
26.5°	1607.8	1675.1	1728.4	1800.8	1874.4	1971.0	2039.1	2061.4	2044.2	1973.0	1893.5
27°	1592.2	1660.7	1714.3	1787.5	1861.8	1960.1	2029.0	2051.7	2034.4	1962.0	1881.0
27.5°	1576.5	1645.8	1699.8	1773.8	1848.9	1948.7	2018.8	2042.3	2024.3	1951.1	1868.9
28°	1560.9	1630.5	1685.3	1759.7	1835.2	1936.6	2008.6	2032.1	2014.1	1939.3	1856.0
28.5°	1544.4	1614.9	1670.5	1745.2	1821.9	1925.2	1998.0	2021.5	2003.1	1927.6	1843.4
29°	1528.4	1599.6	1655.2	1730.3	1808.2	1912.7	1986.7	2011.0	1992.6	1915.5	1830.1
29.5°	1512.3	1584.0	1640.3	1715.9	1794.5	1900.6	1975.7	2000.4	1981.2	1903.3	1816.8
30°	1495.9	1568.7	1624.7	1701.0	1780.4	1888.1	1964.4	1989.4	1970.3	1891.2	1803.1
30.5°	1479.1	1552.3	1609.0	1686.1	1766.0	1874.8	1952.6	1978.1	1958.5	1878.3	1789.8
31°	1462.2	1536.2	1593.3	1671.2	1751.9	1861.8	1940.9	1966.3	1946.8	1865.8	1776.1
31.5°	1445.0	1520.2	1577.3	1655.2	1737.0	1848.5	1928.4	1954.6	1934.6	1852.8	1762.0
32°	1428.2	1503.7	1561.3	1639.5	1721.7	1834.8	1916.2	1942.5	1922.5	1839.9	1747.9
32.5°	1411.0	1486.5	1544.8	1623.5	1706.5	1821.1	1903.7	1930.7	1910.0	1826.2	1733.9
33°	1393.7	1470.1	1528.0	1607.8	1691.2	1806.7	1890.8	1918.6	1897.5	1812.9	1719.0
33.5°	1376.1	1453.2	1511.5	1591.4	1675.5	1792.6	1877.9	1905.3	1884.5	1798.8	1704.5
34°	1358.1	1436.4	1495.1	1575.3	1660.3	1778.5	1864.2	1892.4	1871.6	1785.1	1689.6
34.5°	1340.5	1419.2	1478.3	1558.5	1644.2	1763.6	1850.9	1879.5	1858.3	1771.4	1674.8
35°	1322.5	1401.6	1461.4	1542.5	1628.2	1748.7	1837.2	1866.5	1845.0	1756.9	1659.5
35.5°	1304.5	1384.0	1443.8	1525.2	1611.7	1733.9	1823.1	1852.8	1831.7	1742.5	1644.6
36°	1286.1	1366.3	1426.6	1508.4	1595.7	1718.6	1809.4	1838.7	1817.6	1727.6	1628.6
36.5°	1267.7	1348.7	1409.0	1490.8	1579.3	1703.3	1794.5	1825.1	1803.9	1713.5	1612.9
37°	1249.3	1330.7	1391.8	1474.4	1562.8	1687.3	1780.0	1811.4	1789.4	1698.2	1597.7
37.5°	1230.9	1312.7	1373.8	1457.1	1545.6	1671.6	1765.2	1796.9	1775.3	1683.4	1582.0
38°	1211.7	1294.7	1355.8	1439.5	1528.8	1655.6	1750.3	1782.4	1760.9	1668.1	1566.0
38.5°	1193.0	1276.3	1337.8	1421.1	1511.5	1639.5	1735.4	1767.9	1746.4	1653.2	1549.9
39°	1174.6	1257.5	1319.8	1404.3	1495.1	1623.5	1720.2	1753.8	1731.5	1637.6	1533.9
39.5°	1155.8	1239.5	1301.8	1386.3	1477.1	1607.0	1704.5	1738.6	1717.0	1621.9	1517.8
40°	1135.8	1221.1	1283.4	1368.7	1459.5	1590.2	1689.2	1723.3	1701.8	1606.3	1501.0
40.5°	1117.0	1202.3	1265.0	1350.3	1441.9	1573.8	1673.6	1708.0	1686.5	1590.6	1484.9
41°	1097.5	1183.6	1246.6	1332.7	1424.3	1556.9	1657.1	1693.2	1671.2	1574.6	1468.1
41.5°	1078.3	1164.8	1228.2	1314.7	1406.7	1539.7	1641.5	1677.5	1655.6	1559.3	1451.7
42°	1058.3	1146.0	1209.0	1296.7	1389.0	1522.5	1625.1	1661.4	1639.9	1542.9	1435.2
42.5°	1039.5	1126.8	1191.0	1278.7	1371.4	1505.7	1609.4	1645.8	1624.3	1526.4	1418.0
43°	1019.6	1107.6	1172.2	1260.7	1353.4	1488.5	1592.6	1630.1	1608.6	1509.6	1401.2
43.5°	999.6	1088.5	1153.8	1241.9	1335.4	1471.2	1576.1	1614.1	1592.6	1493.5	1384.3



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
45°	940.5	1030.1	1097.1	1187.1	1281.4	1418.4	1525.6	1565.2	1543.6	1442.7	1332.3
45.5°	920.5	1011.0	1078.7	1169.1	1263.4	1400.8	1508.4	1548.7	1527.2	1425.1	1314.7
46°	900.6	991.4	1059.5	1150.3	1245.4	1383.2	1491.2	1531.5	1510.4	1407.8	1297.1
46.5°	880.6	971.8	1041.1	1131.9	1227.4	1365.2	1474.0	1514.7	1493.5	1390.2	1279.1
47°	861.1	952.6	1021.9	1113.5	1209.4	1347.2	1456.0	1497.5	1475.9	1372.2	1261.1
47.5°	840.7	933.1	1003.1	1095.1	1190.6	1329.2	1438.7	1479.8	1458.3	1354.2	1242.3
48°	820.0	913.5	984.0	1077.1	1172.6	1311.2	1420.7	1462.2	1441.1	1335.0	1223.9
48.5°	800.4	893.5	965.2	1058.3	1154.6	1293.2	1402.7	1444.2	1423.1	1316.2	1205.1
49°	780.4	874.4	946.0	1039.9	1136.2	1274.4	1384.3	1426.2	1404.7	1297.1	1185.9
49.5°	760.5	854.8	927.6	1021.5	1117.4	1256.0	1366.3	1407.8	1385.5	1277.5	1166.7
50°	740.1	835.2	909.2	1002.7	1099.4	1237.6	1347.2	1389.0	1366.7	1257.9	1147.6
50.5°	719.8	815.7	890.0	984.7	1081.0	1218.8	1328.0	1369.9	1347.2	1237.6	1128.8
51°	699.8	795.7	871.2	966.3	1062.6	1200.0	1308.8	1350.3	1327.6	1218.0	1110.0
51.5°	680.2	776.1	852.4	947.9	1044.2	1181.2	1289.2	1330.3	1307.6	1198.8	1091.6
52°	659.9	756.9	833.7	929.6	1025.4	1161.6	1269.3	1310.0	1287.3	1180.4	1074.0
52.5°	640.3	737.4	814.9	911.2	1006.7	1142.5	1249.3	1289.6	1266.9	1162.4	1055.6
53°	620.0	717.8	796.5	892.8	987.9	1122.5	1229.0	1270.1	1247.8	1143.2	1037.2
53.5°	600.0	698.6	777.7	874.8	969.5	1102.9	1208.6	1249.3	1229.0	1123.3	1015.7
54°	580.4	679.5	759.3	855.6	950.7	1083.4	1189.0	1230.5	1210.6	1100.6	993.7
54.5°	560.9	660.3	740.5	837.6	932.3	1064.6	1169.9	1212.5	1191.4	1075.5	968.7
55°	540.9	641.1	722.1	819.2	914.3	1045.8	1151.5	1194.1	1171.4	1047.4	942.9
55.5°	521.7	621.5	704.1	801.6	896.7	1027.8	1132.3	1173.4	1147.6	1020.0	915.9
56°	502.2	603.1	685.3	783.6	878.7	1009.0	1112.3	1150.3	1121.3	989.4	888.1
56.5°	483.0	584.3	667.3	765.6	860.7	989.0	1090.0	1124.5	1093.9	958.9	860.3
57°	463.8	565.2	649.7	748.3	841.1	967.5	1066.1	1098.2	1064.6	927.6	832.1
57.5°	444.6	546.8	632.1	730.7	821.5	946.0	1040.7	1068.9	1032.9	896.7	802.0
58°	426.6	528.4	613.7	713.1	800.8	922.5	1014.5	1038.7	1000.8	863.0	772.2
58.5°	407.8	510.4	595.7	694.3	780.4	898.6	987.1	1006.7	968.3	829.4	742.5
59°	389.4	492.4	578.1	675.5	758.5	874.0	957.3	974.2	934.2	796.5	712.7
59.5°	371.0	474.4	560.1	656.4	737.0	848.1	927.6	939.3	899.4	764.0	682.6
60°	353.4	456.0	542.1	637.2	714.7	822.7	897.1	905.7	864.6	729.9	653.2
60.5°	335.8	438.4	523.3	618.0	693.2	796.5	866.1	870.8	829.7	697.1	623.9
61°	318.6	421.1	505.3	598.0	670.1	769.9	834.1	837.2	795.3	664.6	594.9
61.5°	301.0	403.1	486.9	578.9	647.4	742.9	801.6	802.3	760.1	631.3	565.9
62°	284.5	385.5	468.5	558.9	625.0	715.5	770.3	768.7	726.0	599.2	537.0
62.5°	268.1	367.9	450.5	539.3	601.6	688.1	737.4	734.6	691.2	567.9	509.2
63°	252.1	350.7	431.7	519.8	578.5	659.9	705.3	700.6	657.9	538.6	482.2
63.5°	235.6	333.5	413.7	499.0	555.4	632.1	673.6	666.9	624.7	508.8	455.6
64°	220.7	317.0	395.7	479.5	532.7	604.7	643.1	634.4	592.6	480.6	429.7
64.5°	205.9	300.2	377.7	459.5	509.6	576.9	611.7	602.3	561.3	453.2	404.7
65°	191.4	283.4	360.1	439.9	486.5	549.5	582.0	571.0	529.6	426.6	380.8
65.5°	177.3	267.3	342.1	420.0	463.4	522.5	552.3	540.1	498.6	401.6	359.7
66°	164.0	251.7	324.5	400.4	440.3	495.9	522.9	510.0	468.1	377.3	338.9





TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
67.5°	129.6	205.9	272.0	342.1	373.8	419.6	439.5	425.8	381.6	313.9	276.3
68°	119.8	191.4	255.2	322.9	353.0	395.3	413.3	399.6	357.3	292.4	257.9
68.5°	110.4	177.3	238.7	303.7	332.3	371.4	387.5	374.2	333.1	271.2	241.1
69°	100.6	163.2	221.9	284.9	311.5	349.5	365.2	351.5	308.8	253.2	225.0
69.5°	93.2	149.5	205.5	265.8	291.2	328.0	342.9	329.2	284.9	236.4	209.8
70°	87.7	137.4	189.4	248.1	270.5	306.1	320.9	306.5	265.0	220.4	195.7
70.5°	84.1	125.6	173.8	230.1	252.1	284.1	298.6	284.1	246.2	205.5	182.4
71°	80.2	114.3	158.9	212.5	234.4	265.4	276.3	265.0	228.6	191.4	169.5
71.5°	76.3	102.9	144.4	195.7	217.2	246.2	257.1	246.6	212.1	178.1	157.7
72°	72.4	91.6	132.7	179.6	200.8	228.6	238.7	229.4	197.3	165.9	146.8
72.5°	68.5	83.4	121.3	164.4	184.7	211.7	221.9	213.3	183.2	154.2	135.8
73°	64.6	77.5	110.0	150.3	169.9	196.1	206.3	198.0	170.3	143.2	126.0
73.5°	61.1	73.6	98.6	136.6	156.2	181.2	191.4	184.0	158.5	133.1	116.6
74°	57.5	69.7	86.9	125.6	143.2	167.5	177.3	171.0	147.2	123.3	107.6
74.5°	54.0	66.1	78.7	114.3	130.7	154.6	164.4	158.9	136.6	114.3	99.4
75°	50.5	62.6	71.2	103.3	119.8	142.5	152.3	147.6	126.8	105.7	91.2
75.5°	47.4	59.1	65.4	92.4	109.2	131.1	140.9	137.0	117.0	97.1	83.8
76°	44.2	55.6	59.9	83.4	99.4	120.5	130.3	126.8	108.0	89.2	76.3
76.5°	41.5	52.4	55.2	75.1	90.0	110.4	120.5	117.8	99.4	81.8	69.7
77°	38.7	48.9	51.3	68.1	82.2	101.8	111.2	108.8	90.8	74.8	63.0
77.5°	36.0	45.8	47.7	61.4	74.4	92.8	102.5	100.6	83.0	67.7	56.8
78°	33.3	43.1	45.0	55.6	67.3	84.5	93.9	92.4	75.5	61.4	50.9
78.5°	30.9	40.3	41.9	50.5	60.7	77.1	86.1	84.5	68.1	55.6	45.4
79°	28.6	37.6	39.5	45.8	54.8	70.1	78.7	77.5	61.1	49.7	40.3
79.5°	26.2	34.8	36.8	41.5	49.3	63.4	71.6	70.5	54.8	44.6	36.4
80°	23.9	32.1	34.4	37.6	44.2	57.1	65.0	63.8	48.5	40.3	32.1
80.5°	21.9	29.7	31.7	34.1	39.5	51.7	58.7	57.9	42.7	35.6	27.8
81°	20.0	27.4	29.7	30.9	36.0	45.8	52.8	52.1	38.0	31.3	23.9
81.5°	18.0	25.4	27.4	28.2	32.1	41.1	47.0	46.6	33.3	27.0	19.6
82°	16.0	23.1	25.4	25.4	28.6	36.8	41.9	41.1	28.6	22.7	16.4
82.5°	14.5	21.1	23.1	23.1	24.7	32.9	37.6	36.8	23.5	18.4	13.7
83°	12.5	18.8	21.1	20.7	21.1	29.0	33.3	32.5	18.8	15.3	11.0
83.5°	11.0	17.2	19.6	19.2	18.4	24.7	29.0	28.2	15.3	12.1	8.6
84°	9.8	15.3	17.6	17.2	16.0	20.7	24.7	23.9	11.7	9.4	6.7
84.5°	8.2	13.7	15.7	15.7	14.1	18.0	20.4	19.6	9.0	7.0	5.1
85°	7.0	12.1	14.1	14.1	12.1	15.3	17.2	16.0	6.3	4.7	3.5
85.5°	5.9	10.6	12.9	12.5	10.2	12.5	14.1	12.9	3.9	3.1	2.3
86°	4.7	9.0	11.4	11.4	9.0	10.6	11.4	10.2	2.3	2.0	1.2
86.5°	3.5	7.4	9.8	9.8	7.4	8.6	9.0	7.4	1.6	0.8	0.4
87°	2.7	6.3	8.2	8.6	6.3	6.7	7.0	5.5	1.2	0.4	0.0
87.5°	2.0	5.1	7.0	7.4	5.1	5.5	5.1	3.9	0.8	0.0	0.0
88°	1.6	3.9	5.9	6.3	4.3	3.9	3.5	2.3	0.4	0.0	0.0
88.5°	0.8	3.1	4.7	5.1	3.1	2.7	2.3	1.2	0.4	0.0	0.0



TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	202.5°	225°
90°	0.0	1.2	2.0	2.3	1.2	0.8	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
0°	2165.2	2165.2	2165.2	2165.2	2165.2	2165.2
0.5°	2164.8	2162.8	2160.9	2159.7	2158.1	2157.3
1°	2164.4	2160.5	2156.9	2154.6	2152.3	2151.9
1.5°	2163.6	2158.1	2152.6	2148.7	2146.4	2146.0
2°	2162.8	2155.4	2148.3	2143.3	2140.1	2140.1
2.5°	2161.3	2152.3	2143.6	2137.4	2133.9	2133.9
3°	2159.7	2149.1	2138.6	2131.1	2127.2	2127.6
3.5°	2158.1	2146.0	2133.5	2124.9	2120.5	2121.3
4°	2155.8	2142.1	2128.0	2118.2	2113.1	2114.3
4.5°	2153.8	2138.2	2122.1	2111.2	2106.1	2107.6
5°	2151.1	2133.9	2116.2	2104.1	2098.2	2100.2
5.5°	2148.3	2129.2	2110.0	2096.7	2090.8	2093.2
6°	2145.2	2124.5	2103.3	2089.2	2083.0	2085.3
6.5°	2141.7	2119.4	2096.7	2081.4	2074.8	2077.5
7°	2138.2	2114.3	2089.6	2073.6	2066.5	2069.7
7.5°	2134.2	2108.4	2082.6	2065.4	2057.9	2061.4
8°	2129.9	2102.5	2075.1	2056.8	2049.3	2052.8
8.5°	2125.6	2096.3	2067.3	2048.1	2040.3	2044.2
9°	2120.5	2090.0	2059.5	2039.1	2030.9	2035.2
9.5°	2115.9	2083.4	2051.3	2030.1	2021.5	2026.6
10°	2110.4	2076.3	2042.7	2020.7	2012.1	2017.2
10.5°	2104.9	2069.7	2034.1	2011.0	2002.4	2008.2
11°	2099.0	2061.8	2025.1	2001.6	1992.6	1998.4
11.5°	2093.2	2054.0	2015.7	1991.4	1982.4	1988.7
12°	2086.5	2046.2	2006.3	1981.2	1971.8	1978.5
12.5°	2079.8	2038.0	1996.5	1970.6	1961.3	1968.7
13°	2072.8	2029.7	1986.7	1960.1	1950.7	1958.1
13.5°	2065.8	2020.7	1976.5	1949.1	1940.1	1947.6
14°	2058.3	2011.7	1966.0	1938.6	1928.8	1937.0
14.5°	2050.9	2002.7	1955.8	1927.2	1917.4	1925.6
15°	2042.7	1993.3	1944.8	1915.5	1906.1	1914.7
15.5°	2034.4	1983.6	1933.5	1903.7	1893.9	1903.3
16°	2025.8	1973.4	1922.5	1892.0	1882.6	1892.0
16.5°	2017.2	1963.2	1910.8	1879.8	1870.5	1880.2
17°	2008.2	1952.6	1899.0	1867.7	1858.3	1868.1
17.5°	1998.8	1941.7	1886.9	1854.8	1845.8	1856.0
18°	1989.0	1930.7	1874.8	1842.7	1833.3	1844.2
18.5°	1979.3	1919.4	1862.2	1829.4	1820.0	1831.7
19°	1969.5	1908.0	1849.3	1816.8	1807.4	1818.4
19.5°	1958.9	1896.3	1836.4	1803.1	1794.1	1805.9
20°	1948.3	1884.2	1823.1	1789.8	1780.8	1793.3
20.5°	1937.4	1872.0	1809.8	1775.7	1767.5	1780.0
21°	1926.4	1859.5	1796.1	1762.0	1753.4	1766.0



TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
22.5°	1892.0	1820.7	1754.2	1719.0	1711.2	1725.6
23°	1879.8	1807.4	1740.1	1704.5	1696.7	1711.5
23.5°	1867.7	1793.7	1725.6	1690.0	1682.2	1697.1
24°	1854.8	1779.6	1710.8	1675.1	1667.3	1682.6
24.5°	1842.3	1766.0	1695.9	1659.5	1652.4	1668.1
25°	1829.4	1751.5	1680.2	1644.2	1637.2	1653.2
25.5°	1816.0	1737.8	1665.4	1629.0	1621.9	1638.4
26°	1802.7	1722.9	1650.1	1613.3	1606.7	1623.1
26.5°	1789.0	1708.4	1634.4	1597.3	1591.0	1607.8
27°	1775.3	1693.2	1618.8	1581.2	1575.3	1592.2
27.5°	1761.3	1678.3	1602.7	1565.2	1559.3	1576.5
28°	1747.2	1663.0	1586.7	1549.1	1542.9	1560.9
28.5°	1732.7	1647.4	1570.6	1532.7	1526.8	1544.4
29°	1718.2	1632.1	1554.2	1515.9	1510.8	1528.4
29.5°	1703.3	1616.4	1537.8	1499.0	1493.9	1512.3
30°	1688.5	1600.8	1521.3	1482.6	1477.1	1495.9
30.5°	1673.6	1584.3	1504.5	1465.4	1460.7	1479.1
31°	1658.7	1568.3	1487.7	1448.5	1443.4	1462.2
31.5°	1643.1	1551.9	1470.5	1431.3	1426.6	1445.0
32°	1627.8	1535.4	1453.2	1413.7	1409.0	1428.2
32.5°	1611.7	1519.0	1436.4	1396.5	1391.8	1411.0
33°	1596.1	1502.5	1419.2	1378.9	1374.2	1393.7
33.5°	1580.0	1485.3	1402.0	1361.3	1356.6	1376.1
34°	1564.0	1468.9	1384.0	1343.6	1338.6	1358.1
34.5°	1548.3	1451.7	1366.7	1326.0	1320.9	1340.5
35°	1531.9	1434.8	1348.7	1308.0	1302.5	1322.5
35.5°	1515.5	1418.0	1331.1	1289.6	1284.9	1304.5
36°	1499.0	1400.4	1313.9	1272.0	1266.1	1286.1
36.5°	1482.6	1383.6	1295.9	1254.0	1248.5	1267.7
37°	1465.8	1366.3	1278.3	1235.6	1229.7	1249.3
37.5°	1448.9	1349.1	1260.7	1217.2	1211.4	1230.9
38°	1432.1	1331.5	1242.7	1198.8	1192.6	1211.7
38.5°	1415.3	1313.9	1225.0	1180.8	1174.2	1193.0
39°	1398.8	1296.7	1206.7	1162.4	1155.4	1174.6
39.5°	1381.6	1279.5	1189.0	1144.0	1136.6	1155.8
40°	1364.4	1261.8	1171.0	1125.6	1117.8	1135.8
40.5°	1347.6	1244.2	1153.4	1107.2	1099.0	1117.0
41°	1330.3	1226.2	1135.4	1088.8	1079.5	1097.5
41.5°	1313.5	1209.4	1117.0	1070.5	1060.7	1078.3
42°	1296.3	1192.2	1099.4	1051.7	1041.9	1058.3
42.5°	1278.7	1174.2	1081.8	1033.3	1022.7	1039.5
43°	1261.4	1156.6	1064.2	1014.5	1003.1	1019.6
43.5°	1244.2	1139.3	1045.8	996.5	984.3	999.6



TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
45°	1191.8	1086.5	992.6	940.9	926.0	940.5
45.5°	1174.2	1069.7	974.6	922.9	907.2	920.5
46°	1156.9	1052.4	957.3	904.5	888.1	900.6
46.5°	1138.9	1034.4	939.3	886.1	868.5	880.6
47°	1120.9	1016.8	922.1	867.7	849.3	861.1
47.5°	1102.9	999.6	903.7	849.3	829.7	840.7
48°	1084.5	982.0	886.9	831.3	810.6	820.0
48.5°	1066.5	964.4	868.9	812.9	791.4	800.4
49°	1048.1	947.2	851.7	794.9	772.2	780.4
49.5°	1029.4	929.6	834.1	776.5	753.4	760.5
50°	1011.4	911.9	816.4	758.5	733.9	740.1
50.5°	993.3	893.9	798.8	740.9	714.7	719.8
51°	975.7	876.3	781.6	722.9	695.9	699.8
51.5°	958.1	859.5	764.4	704.5	677.1	680.2
52°	941.7	843.1	747.6	687.3	658.3	659.9
52.5°	924.1	826.6	730.7	669.7	639.1	640.3
53°	905.7	810.2	714.7	652.4	620.4	620.0
53.5°	886.1	793.3	697.8	634.8	602.0	600.0
54°	865.0	775.7	681.4	617.6	583.2	580.4
54.5°	843.8	757.7	664.6	601.2	564.8	560.9
55°	820.4	738.9	647.4	584.3	546.8	540.9
55.5°	796.9	719.0	629.4	566.7	528.8	521.7
56°	772.2	699.0	611.7	549.9	511.2	502.2
56.5°	747.9	678.7	593.7	532.3	493.2	483.0
57°	722.1	657.5	575.7	515.1	475.5	463.8
57.5°	697.1	636.0	557.3	497.5	457.9	444.6
58°	671.2	614.5	539.3	480.6	440.7	426.6
58.5°	645.4	593.0	520.2	463.4	423.5	407.8
59°	620.0	570.6	501.8	446.2	406.3	389.4
59.5°	594.5	548.7	483.0	429.0	389.0	371.0
60°	568.7	526.8	463.8	412.1	371.8	353.4
60.5°	543.6	504.9	444.6	394.5	355.0	335.8
61°	519.0	483.0	425.4	377.7	338.2	318.6
61.5°	493.9	461.4	406.3	360.9	321.7	301.0
62°	469.3	439.9	387.5	344.0	305.7	284.5
62.5°	445.8	418.8	368.3	326.8	289.2	268.1
63°	422.3	398.0	349.1	310.0	273.6	252.1
63.5°	399.6	377.3	330.7	292.4	257.9	235.6
64°	378.1	356.9	312.3	275.5	243.1	220.7
64.5°	357.3	337.8	294.3	258.7	228.2	205.9
65°	336.6	318.6	276.3	242.7	213.7	191.4
65.5°	316.2	299.0	259.5	225.8	198.8	177.3
66°	295.5	280.2	241.9	209.4	185.1	164.0



TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
67.5°	239.5	229.0	194.1	164.8	144.4	129.6
68°	223.5	212.5	178.9	150.7	133.5	119.8
68.5°	207.8	196.9	164.4	136.6	122.5	110.4
69°	193.0	182.4	150.7	126.0	111.9	100.6
69.5°	179.3	168.7	137.0	115.5	101.0	93.2
70°	166.7	155.4	126.4	104.5	90.0	87.7
70.5°	154.2	143.2	116.2	93.9	82.2	84.1
71°	142.5	133.1	105.7	84.9	76.7	80.2
71.5°	131.9	122.9	95.1	77.5	72.8	76.3
72°	121.3	113.1	86.5	70.8	69.3	72.4
72.5°	112.3	102.9	78.7	65.0	65.8	68.5
73°	103.3	93.2	71.2	59.9	62.2	64.6
73.5°	94.7	84.5	64.6	55.2	58.7	61.1
74°	86.9	77.1	58.7	51.3	55.2	57.5
74.5°	79.1	70.1	53.6	48.1	52.1	54.0
75°	72.0	63.8	48.5	45.0	48.9	50.5
75.5°	65.4	57.5	44.2	42.3	45.8	47.4
76°	59.5	52.1	39.9	39.5	42.7	44.2
76.5°	53.2	46.6	36.4	37.2	39.9	41.5
77°	48.1	41.9	33.3	34.4	37.2	38.7
77.5°	43.1	37.6	30.1	32.5	34.4	36.0
78°	38.7	33.7	27.4	30.1	32.1	33.3
78.5°	34.8	29.7	25.0	27.8	29.7	30.9
79°	30.5	26.6	22.7	25.8	27.4	28.6
79.5°	26.6	23.5	20.7	23.5	25.0	26.2
80°	22.7	20.4	18.8	21.5	22.7	23.9
80.5°	19.6	18.0	17.2	19.6	20.7	21.9
81°	16.8	15.7	15.7	18.0	18.8	20.0
81.5°	14.1	14.1	14.1	16.0	16.8	18.0
82°	11.7	12.5	12.5	14.5	14.9	16.0
82.5°	9.8	10.6	11.0	12.9	13.3	14.5
83°	7.8	9.0	9.8	11.4	11.7	12.5
83.5°	6.3	7.4	8.2	9.8	10.2	11.0
84°	5.1	6.3	7.0	8.2	8.6	9.8
84.5°	3.5	5.1	6.3	7.0	7.0	8.2
85°	2.7	4.3	5.1	5.9	5.9	7.0
85.5°	2.0	3.1	3.9	5.1	4.7	5.9
86°	1.2	2.3	3.1	3.9	3.9	4.7
86.5°	0.4	1.6	2.0	2.7	3.1	3.5
87°	0.0	0.8	1.2	2.0	2.3	2.7
87.5°	0.0	0.4	0.4	1.2	1.6	2.0
88°	0.0	0.0	0.0	0.4	0.8	1.6
88.5°	0.0	0.0	0.0	0.0	0.4	0.8



TEST NUMBER: P776446

CATALOG NUMBER: HCDJBL3040CSD-HCD81TRH-HCD81TRLWW-4000lm-3000K

**CANDELA DISTRIBUTION (continued):**

	247.5°	270°	292.5°	315°	337.5°	360°
90°	0.0	0.0	0.0	0.0	0.0	0.0



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Scaled Data Report





— 0°-180°    - - 45°-225°    - - - - 90°-270°    - · - 135°-315°

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Scaled Data Report



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Scaled Data Report





21.5°	1752.6	1812.1	1860.3	1924.5	1987.5	2066.9	2122.9	2142.1	2128.4	2070.1	2002.4
22°	1739.3	1799.6	1848.1	1913.1	1977.7	2058.7	2115.9	2135.0	2121.3	2061.4	1992.2



44°	980.0	1069.3	1134.6	1223.9	1317.4	1453.2	1558.9	1597.7	1576.5	1476.7	1367.1
44.5°	960.5	1049.7	1116.2	1205.9	1299.4	1436.0	1542.5	1581.2	1560.5	1459.9	1349.9



66.5°	151.5	236.0	307.2	380.8	418.0	470.1	494.3	481.0	438.0	356.2	317.8
67°	138.9	220.4	290.0	361.3	396.1	444.2	466.9	453.2	409.8	335.0	297.1



89°	0.4	2.3	3.9	4.3	2.3	2.0	1.2	0.4	0.0	0.0	0.0
89.5°	0.0	1.6	2.7	3.1	1.6	1.2	0.4	0.0	0.0	0.0	0.0



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21.5°	1915.1	1846.6	1782.4	1747.9	1739.3	1752.6
22°	1903.3	1833.7	1768.7	1733.5	1725.6	1739.3



44°	1227.0	1122.1	1027.8	977.7	965.2	980.0
44.5°	1209.0	1104.1	1010.2	959.7	945.6	960.5



66.5°	275.1	263.0	225.4	194.1	171.0	151.5
67°	256.4	245.4	209.0	178.9	157.3	138.9

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89°	0.0	0.0	0.0	0.0	0.0	0.4
89.5°	0.0	0.0	0.0	0.0	0.0	0.0

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(END OF REPORT)