

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: NEO-RAY

Report Number: P243506

Luminaire Tested: **S124DR-H1020D840-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P243506  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1802-639-60)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: NEO-RAY  
Catalog Number: S124DR-H1020D840-X4F0-XX-UDD-A-W  
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER.  
HIGH PERFORMANCE LIGHT ENGINE  
Light Source: (184) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

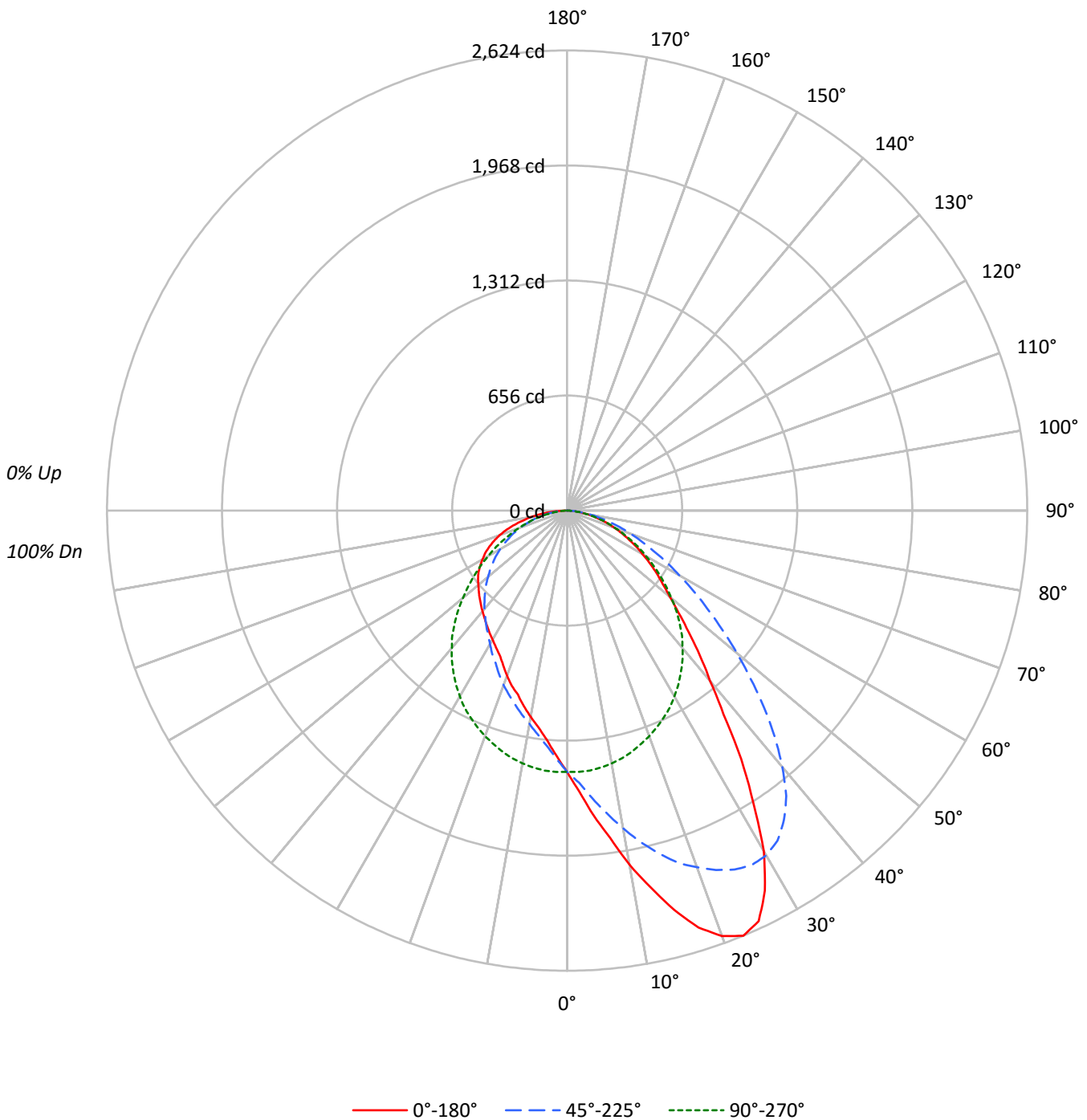
Lumens per Lamp: N/A  
Luminaire Lumens: 4271.2 lumens  
Efficiency: N/A  
Efficacy: 135.6 lumens/watt  
Spacing Criteria (0/90/45): 1.35 / 1.22 / 1.45  
Luminous Opening: Rectangular (W 3.88' x L: 0.31' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 31.5  
Input Voltage (V): 120  
Input Current (Ain): 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: 25 FT



TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

### Luminous Intensity Polar Plot





TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

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

RF	20				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	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	105	101	97	107	103	99	96	98	95	93	94	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	83	79	76	80	77	74	72
3	92	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61
4	84	73	64	58	82	71	63	57	69	62	56	66	60	56	64	59	55	53
5	78	65	56	50	75	64	56	50	62	55	49	60	54	49	58	53	48	46
6	72	59	50	44	70	58	50	44	56	49	43	54	48	43	53	47	43	41
7	67	53	45	39	65	53	45	39	51	44	38	50	43	38	48	42	38	36
8	62	49	41	35	61	48	40	35	47	40	35	46	39	34	44	39	34	32
9	58	45	37	31	57	44	37	31	43	36	31	42	36	31	41	35	31	29
10	54	41	34	29	53	41	34	28	40	33	28	39	33	28	38	32	28	26

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

	0°	90°	180°
0°	13241	13241	13241
5°	15580	13275	11718
10°	18516	13214	10789
15°	21687	13098	9993
20°	24419	12946	9478
25°	25343	12773	8921
30°	23015	12556	8724
35°	18776	12258	8669
40°	14703	11873	8706
45°	12306	11395	8866
50°	10560	10728	9131
55°	9649	10007	9573
60°	8841	9262	9922
65°	8108	8478	10306
70°	7459	7649	10619
75°	6639	6725	10609
80°	5539	5508	10581
85°	4212	4151	9924



TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	145.0	3.4
10°-20°	449.1	10.5
20°-30°	721.4	16.9
30°-40°	824.7	19.3
40°-50°	759.1	17.8
50°-60°	620.9	14.5
60°-70°	442.5	10.4
70°-80°	243.2	5.7
80°-90°	65.3	1.5
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°	1315.5	30.8
0°-40°	2140.1	50.1
0°-60°	3520.2	82.4
0°-90°	4271.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4271.2	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1490	1490	1490	1490	1490	
5°	1746	1646	1488	1345	1313	175
15°	2357	2025	1423	1146	1086	672
25°	2584	2259	1302	963	910	1160
35°	1730	2156	1130	804	799	1075
45°	979	1589	906	662	705	764
55°	623	976	646	516	618	558
65°	386	541	403	362	490	385
75°	193	250	196	200	309	207
85°	41	51	41	56	97	49
90°	0	0	0	0	0	



TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6
2.5°	1603.9	1599.0	1596.6	1593.5	1592.9	1589.9	1583.8	1575.3	1564.4	1552.8	1552.8
5°	1746.1	1744.9	1735.8	1736.4	1724.9	1712.1	1702.4	1690.2	1666.5	1646.4	1632.5
7.5°	1882.3	1895.1	1892.1	1882.3	1865.3	1847.1	1827.6	1810.6	1766.8	1742.5	1722.4
10°	2051.4	2056.2	2047.7	2033.7	2018.5	1983.3	1957.7	1929.2	1881.7	1840.4	1803.9
12.5°	2199.7	2211.3	2196.1	2182.7	2146.8	2120.7	2095.1	2038.0	1988.1	1935.8	1882.9
15°	2356.6	2344.4	2352.3	2319.5	2293.9	2269.0	2204.0	2145.6	2089.1	2024.6	1969.3
17.5°	2492.8	2492.8	2478.2	2456.9	2430.1	2383.3	2318.3	2253.8	2191.2	2106.7	2028.3
20°	2581.5	2588.2	2571.2	2548.7	2516.5	2467.8	2416.2	2346.2	2262.9	2164.4	2075.7
22.5°	2624.1	2625.3	2619.2	2600.4	2574.2	2532.9	2480.0	2411.9	2323.7	2217.9	2124.9
25°	2584.0	2590.6	2588.8	2587.6	2574.2	2550.5	2508.0	2444.7	2364.5	2258.7	2158.4
27.5°	2442.9	2459.3	2473.3	2479.4	2494.0	2495.2	2482.4	2444.1	2378.5	2278.7	2166.9
30°	2242.3	2233.8	2271.4	2290.3	2340.2	2369.9	2391.2	2388.8	2351.1	2270.2	2163.8
32.5°	1974.7	1997.9	2024.6	2069.0	2128.0	2197.3	2249.6	2288.5	2284.8	2231.9	2143.2
35°	1730.3	1730.3	1764.4	1819.1	1881.7	1965.0	2052.6	2124.9	2169.3	2155.9	2093.3
37.5°	1465.3	1481.7	1520.6	1563.1	1639.7	1720.0	1835.5	1931.6	2024.6	2052.6	2020.3
40°	1267.1	1274.3	1315.7	1351.6	1430.0	1513.3	1610.0	1732.8	1839.8	1908.5	1912.7
42.5°	1119.9	1119.3	1136.3	1168.6	1231.8	1306.0	1410.5	1530.9	1656.2	1753.4	1799.0
45°	978.9	977.6	995.3	1028.1	1073.1	1138.8	1229.4	1349.7	1478.0	1588.7	1660.4
47.5°	859.7	870.6	878.5	904.1	941.2	997.1	1074.9	1171.0	1294.4	1418.4	1515.1
50°	763.6	768.5	785.5	797.7	839.0	877.9	940.6	1026.9	1132.7	1262.8	1367.4
52.5°	687.0	690.1	700.4	716.2	739.9	774.0	823.8	903.5	998.9	1112.0	1220.2
55°	622.6	620.8	627.4	637.8	658.5	687.0	723.5	784.3	867.6	976.4	1076.1
57.5°	559.4	559.4	565.4	572.7	584.3	608.0	643.9	691.9	758.8	855.4	943.6
60°	497.3	501.6	504.0	511.3	521.0	538.7	565.4	603.1	659.7	738.7	826.3
62.5°	442.6	442.6	446.9	449.3	462.1	474.8	494.3	526.5	570.9	641.4	709.5
65°	385.5	389.1	389.1	394.0	404.9	414.6	429.8	454.2	490.6	541.1	604.9
67.5°	336.8	336.8	339.9	342.3	348.4	355.1	368.4	387.3	418.3	458.4	516.2
70°	287.0	288.8	287.6	290.6	294.3	301.0	310.7	326.5	349.0	383.6	426.2
72.5°	242.0	239.5	240.8	243.8	245.6	249.9	256.0	268.1	286.4	314.3	345.3
75°	193.3	192.1	196.4	195.2	198.2	201.9	207.3	216.4	230.4	249.9	273.6
77.5°	150.8	149.0	150.8	152.0	153.2	156.3	160.5	166.0	175.7	188.5	209.8
80°	108.2	107.6	108.8	110.0	110.7	115.5	116.7	122.2	126.5	136.2	146.5
82.5°	71.7	73.0	73.6	74.8	74.2	76.6	77.8	81.5	85.1	90.0	97.9
85°	41.3	39.5	41.3	41.3	41.3	44.4	43.8	46.2	48.6	51.1	56.5
87.5°	14.6	14.6	15.2	15.8	15.8	17.6	17.0	18.2	20.7	20.7	22.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6
2.5°	1549.2	1542.5	1537.6	1523.6	1515.1	1507.2	1499.9	1492.0	1483.5	1472.6	1465.9
5°	1617.9	1603.3	1582.0	1562.5	1540.6	1521.2	1505.4	1487.8	1468.3	1448.2	1430.6
7.5°	1693.9	1666.5	1633.7	1597.8	1563.7	1535.2	1505.4	1477.4	1450.1	1423.3	1398.4
10°	1769.9	1722.4	1679.3	1630.0	1585.0	1541.9	1502.9	1464.0	1430.0	1394.7	1363.1
12.5°	1840.4	1783.2	1720.0	1658.6	1598.4	1542.5	1494.4	1447.0	1403.2	1361.3	1324.2
15°	1894.5	1822.8	1748.0	1675.0	1605.7	1547.3	1484.7	1423.3	1377.7	1326.6	1285.9
17.5°	1956.5	1871.4	1797.2	1709.7	1623.3	1529.1	1462.8	1395.9	1341.2	1292.0	1251.2
20°	1997.9	1904.2	1797.2	1698.1	1609.3	1524.8	1445.2	1368.6	1310.8	1253.7	1204.4
22.5°	2030.7	1934.0	1816.1	1712.7	1601.4	1499.3	1413.0	1337.6	1269.5	1215.4	1168.6
25°	2047.7	1929.8	1817.3	1692.0	1580.8	1482.9	1385.6	1302.3	1233.6	1173.4	1133.3
27.5°	2048.3	1927.3	1794.2	1670.1	1551.0	1445.2	1349.1	1267.1	1189.8	1132.1	1084.0
30°	2045.3	1911.5	1771.1	1635.5	1516.9	1408.7	1308.4	1223.3	1152.7	1091.3	1045.7
32.5°	2025.8	1889.6	1736.4	1594.1	1465.3	1356.4	1264.0	1179.5	1104.1	1048.2	1000.1
35°	1982.0	1841.6	1687.8	1541.3	1419.0	1306.0	1214.8	1129.6	1062.2	1001.4	952.1
37.5°	1926.1	1794.8	1638.5	1485.3	1353.4	1246.4	1160.7	1080.4	1009.9	953.9	904.7
40°	1855.6	1732.2	1578.3	1419.0	1287.1	1178.9	1098.0	1023.2	963.1	905.9	857.9
42.5°	1758.9	1664.1	1506.0	1351.0	1212.9	1110.8	1032.4	970.4	908.3	856.7	808.6
45°	1655.6	1569.2	1428.8	1275.0	1142.4	1037.2	963.7	906.5	853.6	801.3	762.4
47.5°	1541.3	1470.7	1340.6	1190.4	1059.7	966.7	894.4	843.3	794.6	754.5	715.6
50°	1405.1	1368.0	1246.4	1110.2	983.1	887.7	828.1	775.8	739.9	701.0	664.5
52.5°	1278.6	1248.8	1149.7	1016.0	900.4	816.5	752.7	711.3	676.1	647.5	618.3
55°	1141.2	1126.0	1042.1	926.6	822.0	738.1	683.4	645.7	617.7	591.0	569.7
57.5°	1014.7	1013.5	939.3	840.2	738.1	667.0	614.7	583.7	559.4	540.5	522.3
60°	885.2	895.6	834.8	744.2	663.3	596.4	549.0	521.0	504.6	487.0	471.8
62.5°	767.9	783.7	728.4	657.2	577.6	522.9	486.4	465.1	446.9	434.1	422.6
65°	655.4	675.5	630.5	566.6	505.8	454.2	423.2	403.1	389.1	381.8	373.9
67.5°	556.3	567.3	536.9	487.0	436.5	391.5	366.0	348.4	336.2	333.2	324.1
70°	457.2	470.0	448.7	403.1	364.2	331.4	308.3	294.3	287.0	282.7	276.6
72.5°	377.6	383.0	361.8	330.1	299.1	271.8	254.7	244.4	235.9	234.1	231.0
75°	295.5	303.4	286.4	262.0	236.5	217.1	204.3	195.8	191.5	188.5	188.5
77.5°	223.1	229.8	220.1	198.8	183.6	166.6	158.1	150.2	148.3	145.3	146.5
80°	158.7	161.7	156.3	141.7	128.3	119.2	111.9	107.6	107.0	104.6	107.0
82.5°	105.2	105.8	99.7	93.0	82.7	77.8	73.0	71.1	70.5	70.5	69.3
85°	58.4	59.6	55.3	51.1	47.4	43.2	42.0	40.7	39.5	41.3	42.6
87.5°	22.5	23.1	22.5	20.7	19.5	18.2	17.6	18.8	17.0	18.2	18.8
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6	1489.6
2.5°	1455.5	1450.7	1443.4	1431.2	1422.7	1413.6	1409.9	1411.1	1407.5	1402.6	1403.8
5°	1417.2	1403.2	1391.1	1374.1	1358.2	1344.9	1340.6	1335.1	1330.3	1327.2	1324.2
7.5°	1376.5	1357.0	1338.8	1321.8	1303.5	1286.5	1279.8	1275.0	1272.5	1264.0	1260.4
10°	1337.6	1315.1	1293.2	1273.1	1254.3	1235.4	1228.7	1222.7	1214.2	1210.5	1206.3
12.5°	1296.2	1273.7	1250.0	1225.7	1206.9	1191.7	1180.1	1175.9	1167.3	1163.7	1161.3
15°	1256.1	1228.7	1209.9	1191.1	1162.5	1145.5	1140.6	1125.4	1120.5	1113.2	1108.4
17.5°	1216.0	1190.4	1162.5	1140.6	1123.0	1101.7	1090.1	1083.4	1074.3	1067.6	1058.5
20°	1176.5	1146.7	1124.8	1097.4	1078.0	1058.5	1043.9	1037.8	1029.9	1020.8	1008.0
22.5°	1138.2	1105.3	1084.0	1058.5	1034.2	1011.7	999.5	991.0	975.2	973.4	961.8
25°	1093.2	1064.0	1036.0	1009.3	985.6	963.1	955.2	941.8	936.3	925.4	923.5
27.5°	1050.6	1019.6	989.2	960.0	939.3	923.5	909.6	901.0	895.6	887.1	887.7
30°	1006.2	972.2	943.6	916.8	894.4	879.2	870.0	865.8	857.9	856.7	852.4
32.5°	958.8	927.8	898.0	874.3	851.2	837.8	833.6	829.3	824.4	825.0	823.8
35°	911.4	884.0	852.4	830.5	811.7	803.8	797.1	795.9	794.0	795.3	795.3
37.5°	865.2	835.4	809.2	789.2	778.2	767.3	764.2	763.6	764.2	765.5	768.5
40°	820.2	792.8	767.3	750.9	738.7	733.8	729.6	731.4	733.8	738.1	741.7
42.5°	775.2	749.0	727.8	711.3	699.8	697.4	698.0	701.6	702.2	708.3	715.0
45°	727.8	705.3	685.2	672.4	665.1	662.1	663.3	667.0	671.2	679.7	688.2
47.5°	684.0	663.9	646.3	633.5	628.1	626.8	629.3	634.1	643.9	652.4	662.1
50°	639.6	621.4	604.9	593.4	592.8	588.5	594.0	600.1	611.6	623.2	637.8
52.5°	595.8	578.2	564.2	555.1	552.7	552.7	559.4	570.3	580.6	595.8	609.2
55°	550.2	534.4	521.0	518.0	514.4	516.2	523.5	534.4	549.0	566.0	580.6
57.5°	503.4	490.0	480.3	476.1	474.2	480.3	488.8	500.4	519.2	536.2	552.1
60°	459.0	447.5	437.1	435.9	434.7	442.6	453.0	465.1	484.0	501.0	520.4
62.5°	411.6	402.5	395.8	394.0	394.0	401.9	413.4	429.2	446.9	465.1	485.8
65°	363.6	355.7	353.8	351.4	356.9	361.8	373.3	388.5	407.4	427.4	449.3
67.5°	319.2	314.3	310.7	310.7	314.9	324.1	334.4	349.6	369.0	390.3	409.8
70°	274.8	269.9	266.9	269.9	272.4	283.3	294.3	308.9	327.1	347.8	368.4
72.5°	228.6	229.2	229.8	229.2	231.6	242.0	252.9	266.9	284.5	304.6	323.5
75°	187.9	184.8	185.4	186.7	194.6	200.0	211.0	224.3	243.2	261.4	277.2
77.5°	145.9	144.7	147.7	147.7	155.0	161.7	170.8	184.2	200.6	217.1	229.8
80°	107.0	107.6	110.0	110.7	116.7	124.0	133.8	142.9	157.5	169.0	181.2
82.5°	72.4	73.6	76.6	80.9	83.3	87.6	96.1	105.8	116.1	128.3	135.6
85°	42.0	43.8	46.2	49.2	51.7	55.9	62.0	69.9	77.2	83.9	90.0
87.5°	20.7	20.7	22.5	23.7	25.5	28.0	32.2	35.3	40.1	45.0	47.4
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





TEST NUMBER: P243506

CATALOG NUMBER: S124DR-H1020D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	1489.6	1489.6	1489.6	1489.6
2.5°	1401.4	1400.8	1398.4	1399.6
5°	1322.4	1316.3	1315.7	1313.3
7.5°	1254.3	1252.5	1252.5	1247.6
10°	1202.0	1196.5	1197.7	1195.3
12.5°	1152.1	1149.1	1145.5	1141.8
15°	1096.2	1096.2	1096.2	1085.9
17.5°	1052.4	1051.8	1048.8	1048.2
20°	1006.8	1004.4	996.5	1002.0
22.5°	960.6	958.8	952.1	953.3
25°	917.5	915.6	914.4	909.6
27.5°	880.4	881.0	882.2	879.2
30°	852.4	850.6	853.0	850.0
32.5°	826.3	826.3	823.8	824.4
35°	796.5	798.9	799.5	798.9
37.5°	770.3	773.4	775.8	773.4
40°	746.0	748.4	750.9	750.3
42.5°	720.5	724.7	726.5	728.4
45°	696.1	701.6	704.7	705.3
47.5°	671.2	677.9	684.0	683.4
50°	646.9	655.4	660.9	660.3
52.5°	622.6	631.1	637.8	640.8
55°	595.2	606.2	612.2	617.7
57.5°	567.9	580.0	586.1	588.5
60°	537.5	548.4	556.3	558.1
62.5°	503.4	515.0	525.3	527.7
65°	468.2	480.9	488.8	490.0
67.5°	427.4	439.6	447.5	451.1
70°	385.5	394.6	403.1	408.6
72.5°	338.7	349.6	357.5	361.1
75°	290.0	302.2	306.4	308.9
77.5°	239.5	246.8	253.5	254.1
80°	189.1	198.2	200.6	206.7
82.5°	139.2	147.7	145.9	148.3
85°	91.8	94.8	96.7	97.3
87.5°	48.6	50.5	51.7	52.3
90°	0.0	0.0	0.0	0.0

(END OF REPORT)