

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: P242646

Luminaire Tested: **S124DR-S1020D840-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P242646  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1802-639-21)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: NEO-RAY  
Catalog Number: S124DR-S1020D840-X4F0-XX-UDD-A-W  
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER  
STANDARD LIGHT ENGINE  
Light Source: (92) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4289.3 lumens  
Efficiency: N/A  
Efficacy: 123.3 lumens/watt  
Spacing Criteria (0/90/45): 1.3 / 1.22 / 1.41  
Luminous Opening: Rectangular (W 3.88' x L: 0.31' x H: 0')  
CIE Type: Direct

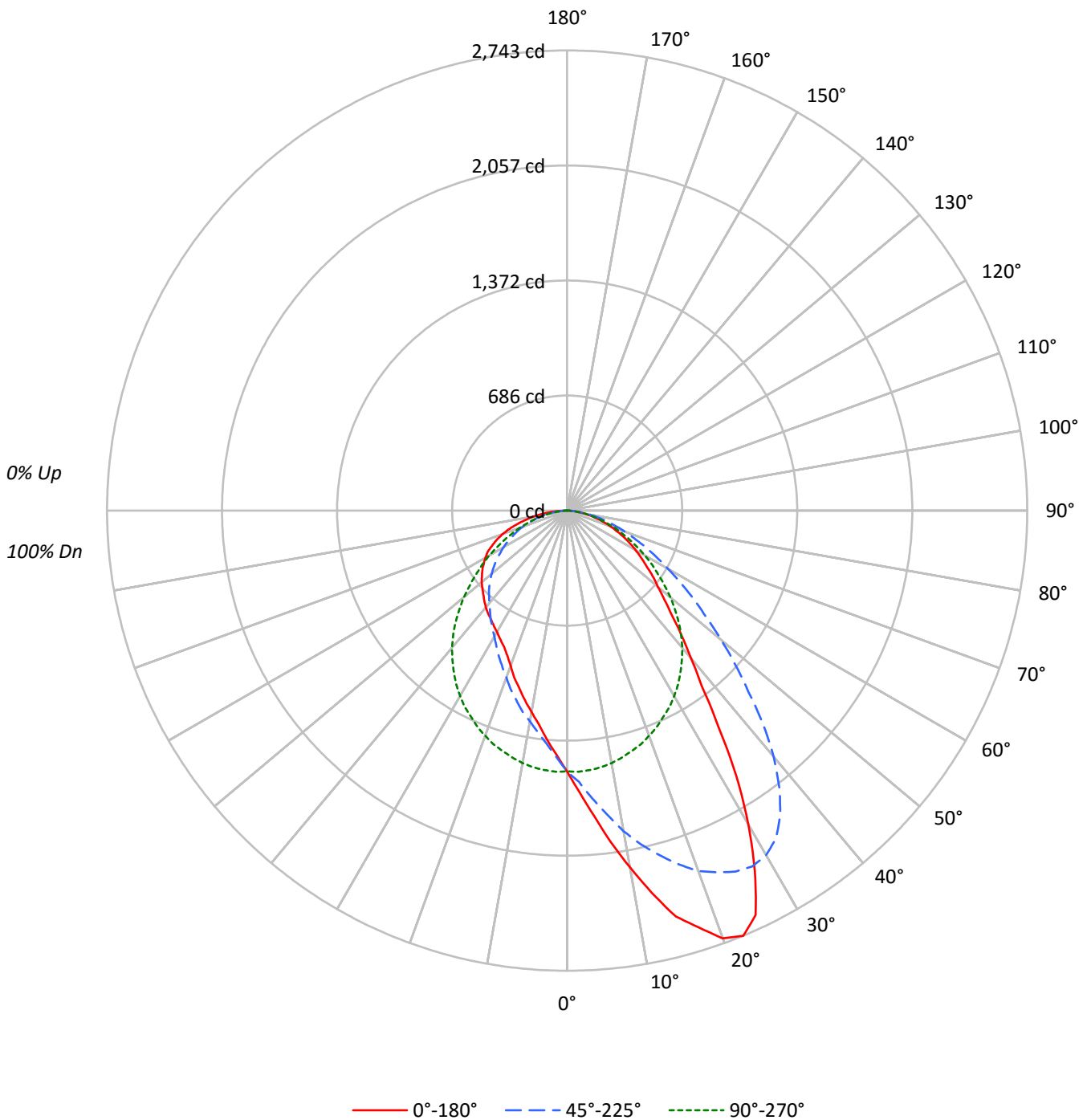
Input Watts (W): 34.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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### Luminous Intensity Polar Plot





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**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	95	92	90	91	89	87	85
2	100	92	86	80	98	90	84	79	87	82	78	84	79	76	81	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	64	62
4	84	73	64	58	82	72	64	58	69	62	57	67	61	56	65	60	55	53
5	78	65	57	50	76	64	56	50	62	55	50	60	54	49	58	53	49	46
6	72	59	51	44	70	58	50	44	56	49	44	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	52	44	39	50	44	39	49	43	38	36
8	62	49	41	35	61	49	41	35	47	40	35	46	40	35	45	39	35	33
9	58	45	37	32	57	45	37	32	44	37	32	43	36	32	42	36	31	30
10	55	42	34	29	54	41	34	29	40	34	29	39	33	29	39	33	29	27

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

	0°	90°	180°
0°	13817	13817	13817
5°	16272	13853	12227
10°	19482	13792	11008
15°	23050	13653	10109
20°	25668	13510	9307
25°	26083	13300	8753
30°	22194	13099	8579
35°	17063	12773	8580
40°	13300	12388	8742
45°	11090	11810	8888
50°	9759	11104	9189
55°	8940	10258	9560
60°	8379	9502	10005
65°	7801	8655	10373
70°	7129	7815	10609
75°	6367	6879	10482
80°	5339	5636	10151
85°	3937	4069	9720



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	151.3	3.5
10°-20°	467.0	10.9
20°-30°	741.8	17.3
30°-40°	824.2	19.2
40°-50°	749.6	17.5
50°-60°	612.5	14.3
60°-70°	437.3	10.2
70°-80°	240.6	5.6
80°-90°	65.0	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°	1360.0	31.7
0°-40°	2184.3	50.9
0°-60°	3546.4	82.7
0°-90°	4289.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4289.3	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1554	1554	1554	1554	1554	
5°	1824	1722	1552	1395	1370	185
15°	2505	2126	1484	1169	1098	708
25°	2659	2374	1356	961	892	1180
35°	1572	2214	1177	794	791	995
45°	882	1529	940	658	707	693
55°	577	920	662	514	617	521
65°	371	513	412	357	493	367
75°	185	239	200	199	305	197
85°	39	50	40	57	95	47
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4
2.5°	1679.3	1678.7	1672.3	1671.0	1666.5	1660.7	1659.4	1649.1	1628.5	1618.8	1616.2
5°	1823.6	1836.5	1819.7	1816.5	1814.6	1793.3	1782.4	1769.5	1739.9	1722.5	1709.0
7.5°	1992.3	1992.9	1985.8	1978.8	1966.5	1948.5	1924.0	1895.7	1861.6	1826.8	1802.3
10°	2158.4	2163.6	2155.2	2153.9	2121.1	2100.5	2059.2	2024.5	1984.6	1940.1	1899.6
12.5°	2333.6	2323.3	2320.0	2285.9	2286.6	2244.7	2195.1	2159.1	2092.1	2039.3	1982.0
15°	2504.8	2490.7	2481.7	2443.7	2425.0	2372.8	2322.0	2282.7	2202.2	2125.6	2067.6
17.5°	2604.0	2621.4	2598.2	2582.8	2531.9	2497.8	2446.9	2366.4	2306.5	2211.2	2144.9
20°	2713.5	2714.8	2703.2	2687.1	2649.1	2602.7	2546.0	2455.9	2380.6	2285.9	2185.5
22.5°	2743.1	2743.1	2739.9	2725.1	2698.7	2663.2	2605.9	2534.5	2439.2	2334.2	2233.7
25°	2659.4	2656.8	2662.6	2679.3	2668.4	2656.8	2624.0	2567.9	2482.9	2374.1	2265.9
27.5°	2422.4	2439.2	2473.9	2515.1	2544.8	2571.2	2569.2	2545.4	2484.9	2390.9	2275.6
30°	2162.3	2184.2	2208.6	2249.8	2329.7	2375.4	2425.6	2463.6	2442.4	2370.9	2265.3
32.5°	1876.4	1877.7	1916.9	1965.2	2036.7	2135.2	2222.2	2309.1	2346.4	2317.5	2233.7
35°	1572.4	1581.5	1620.7	1667.1	1756.6	1864.1	1983.9	2090.8	2179.0	2214.4	2169.4
37.5°	1317.5	1345.8	1375.4	1428.2	1510.0	1607.2	1736.0	1869.3	1998.7	2077.3	2085.6
40°	1146.2	1162.3	1182.2	1220.2	1287.2	1382.5	1489.4	1647.8	1787.5	1913.7	1954.9
42.5°	1011.0	1018.7	1029.0	1062.5	1109.5	1204.1	1299.4	1434.0	1574.4	1731.5	1807.5
45°	882.2	891.8	912.4	932.4	971.0	1036.7	1127.5	1242.1	1383.1	1528.7	1656.2
47.5°	785.6	792.0	804.9	826.8	861.6	906.0	983.3	1080.5	1218.3	1359.3	1495.8
50°	705.7	710.9	720.5	739.9	765.0	803.6	864.1	953.6	1056.0	1198.3	1331.6
52.5°	642.6	643.9	650.4	661.9	680.6	711.5	758.5	828.7	922.1	1045.1	1177.7
55°	576.9	579.5	586.0	595.6	613.0	633.6	671.6	727.0	810.0	920.2	1035.4
57.5°	522.9	525.4	530.6	534.5	549.9	567.3	598.2	638.1	703.2	801.0	906.0
60°	471.3	470.1	476.5	479.7	489.4	503.5	526.1	564.1	618.8	694.1	788.8
62.5°	421.1	419.2	424.3	428.8	433.4	444.9	462.3	490.0	531.9	598.2	676.8
65°	370.9	368.3	371.5	376.7	381.8	388.3	401.8	428.2	463.6	512.6	575.0
67.5°	319.4	322.6	322.6	325.8	329.0	338.1	347.7	368.3	393.4	433.4	488.7
70°	274.3	275.0	277.5	277.5	279.5	287.2	294.9	305.9	330.3	366.4	409.5
72.5°	229.2	232.5	230.5	233.1	234.4	238.9	244.0	254.3	274.3	298.8	333.5
75°	185.4	187.4	187.4	188.0	190.0	191.9	196.4	204.1	218.9	238.9	264.0
77.5°	142.9	142.9	144.2	146.8	146.8	150.0	153.9	159.7	168.1	182.9	199.0
80°	104.3	105.6	105.0	106.2	106.2	108.8	110.1	117.8	121.1	130.1	142.3
82.5°	69.5	70.8	70.8	72.8	74.1	74.1	76.0	77.9	81.1	88.9	92.1
85°	38.6	39.9	38.6	39.9	41.9	42.5	44.4	45.1	47.6	49.6	54.1
87.5°	14.2	16.1	16.1	16.7	18.0	18.7	19.3	18.7	21.2	21.9	24.5
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4
2.5°	1616.9	1607.9	1601.4	1596.3	1582.1	1573.7	1567.3	1558.3	1548.0	1537.0	1523.5
5°	1695.4	1673.5	1657.4	1633.0	1609.8	1590.5	1570.5	1552.5	1530.6	1506.8	1489.4
7.5°	1775.9	1745.7	1705.1	1673.5	1635.5	1602.7	1573.7	1543.5	1511.3	1480.4	1451.4
10°	1851.9	1810.1	1763.7	1709.0	1657.4	1611.7	1569.2	1528.0	1488.1	1448.2	1414.0
12.5°	1933.7	1879.0	1804.9	1738.6	1679.3	1614.3	1560.9	1508.1	1457.8	1415.3	1374.1
15°	2005.2	1929.8	1850.6	1765.0	1689.0	1617.5	1547.3	1483.6	1429.5	1374.1	1335.5
17.5°	2050.2	1956.9	1871.9	1782.4	1694.8	1605.3	1532.5	1461.0	1394.1	1340.0	1291.7
20°	2094.7	2001.9	1889.3	1799.7	1690.3	1597.6	1510.0	1428.2	1357.4	1298.8	1248.6
22.5°	2133.3	2022.5	1909.9	1784.9	1676.1	1576.3	1478.4	1396.0	1323.2	1260.8	1213.1
25°	2142.3	2019.3	1897.0	1779.8	1656.2	1539.6	1452.7	1356.1	1278.8	1213.8	1162.3
27.5°	2145.5	2015.5	1879.6	1752.1	1624.6	1518.4	1405.0	1320.7	1240.8	1171.9	1123.0
30°	2138.4	2001.3	1852.5	1711.5	1583.4	1465.6	1370.3	1276.2	1194.5	1126.2	1074.7
32.5°	2115.9	1971.7	1817.8	1666.5	1532.5	1417.9	1318.7	1230.5	1151.3	1084.4	1029.6
35°	2068.3	1927.2	1764.3	1609.1	1473.3	1356.7	1267.9	1177.1	1097.2	1033.5	981.3
37.5°	2004.5	1873.2	1707.7	1546.0	1415.3	1296.8	1207.3	1123.6	1051.5	985.8	931.7
40°	1915.7	1803.6	1637.5	1481.0	1336.8	1225.4	1143.0	1067.6	996.1	935.0	884.1
42.5°	1813.3	1719.3	1569.2	1401.2	1263.4	1151.3	1071.5	1005.8	939.5	884.1	833.2
45°	1687.7	1623.3	1479.1	1325.8	1180.9	1075.3	998.7	939.5	882.8	827.4	784.9
47.5°	1548.0	1511.9	1386.4	1239.5	1100.5	994.9	928.5	871.9	820.4	772.1	734.1
50°	1407.0	1391.5	1286.5	1146.2	1014.8	916.9	850.0	803.0	760.5	719.3	683.8
52.5°	1267.9	1271.1	1179.0	1053.4	934.3	841.0	774.6	731.5	696.1	664.5	633.6
55°	1125.6	1143.6	1069.5	954.9	846.1	761.1	701.2	661.9	636.2	608.5	584.7
57.5°	994.9	1025.1	960.7	855.8	763.7	682.6	629.8	599.5	571.2	553.1	534.5
60°	867.4	895.7	848.0	763.0	677.4	610.4	560.9	534.5	510.6	499.0	486.8
62.5°	754.0	778.5	746.3	669.0	597.6	533.8	493.9	468.8	454.6	441.7	434.6
65°	647.1	668.4	638.1	580.8	517.1	465.6	431.4	411.5	396.0	390.9	381.8
67.5°	541.5	560.9	544.8	494.5	440.4	399.9	372.8	351.6	342.6	337.4	331.6
70°	449.5	468.8	451.4	408.9	369.6	336.8	311.7	300.7	291.1	289.1	280.1
72.5°	371.5	383.1	365.7	334.8	302.6	276.2	258.2	246.6	242.8	238.9	235.0
75°	290.4	302.0	290.4	264.6	240.8	221.5	204.8	200.3	194.5	192.5	189.3
77.5°	217.6	228.6	219.6	202.2	183.5	167.4	157.8	151.3	150.7	146.8	148.1
80°	157.1	163.6	155.2	144.2	130.1	119.8	113.3	110.1	106.2	105.0	107.5
82.5°	101.7	103.7	100.5	94.0	84.4	78.6	74.7	70.8	70.8	71.5	70.8
85°	58.6	58.0	57.3	50.9	47.6	43.1	40.6	39.9	39.3	40.6	41.9
87.5°	24.5	25.1	24.5	21.9	20.0	18.0	17.4	16.7	17.4	18.0	18.7
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



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**CANDELA DISTRIBUTION (continued):**

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4	1554.4
2.5°	1517.1	1511.3	1502.9	1491.3	1481.7	1471.4	1468.8	1464.9	1472.6	1466.2	1464.3
5°	1474.6	1461.0	1443.7	1423.7	1412.1	1395.4	1392.1	1385.7	1379.3	1378.6	1372.2
7.5°	1430.1	1411.5	1389.6	1369.0	1350.9	1332.9	1321.3	1320.0	1309.7	1304.6	1298.1
10°	1387.6	1363.2	1336.8	1317.5	1295.6	1276.2	1262.7	1255.0	1248.6	1241.5	1235.0
12.5°	1337.4	1311.0	1290.4	1269.2	1242.1	1228.6	1204.1	1189.3	1189.3	1191.2	1171.9
15°	1300.7	1275.0	1241.5	1211.9	1197.7	1169.4	1157.1	1141.7	1132.0	1122.3	1114.6
17.5°	1255.6	1224.1	1198.3	1164.8	1138.4	1117.2	1100.5	1092.1	1076.6	1062.5	1052.8
20°	1213.8	1179.7	1152.0	1115.9	1086.3	1058.6	1045.1	1032.2	1021.3	1009.7	998.7
22.5°	1171.3	1135.2	1099.8	1065.0	1038.0	1008.4	995.5	976.8	966.5	961.4	950.4
25°	1126.2	1087.6	1048.9	1015.5	987.1	961.4	944.0	930.5	918.9	913.7	906.6
27.5°	1077.3	1039.3	1002.6	963.9	931.1	912.4	898.3	887.3	880.2	872.5	869.3
30°	1030.9	991.0	951.1	915.7	886.0	867.4	854.5	847.4	842.2	839.0	835.8
32.5°	983.9	944.6	902.1	870.6	844.8	828.7	819.7	812.6	810.7	810.0	809.4
35°	933.0	893.1	854.5	825.5	800.4	793.9	785.6	781.7	780.4	784.9	786.9
37.5°	884.1	846.8	810.7	781.7	765.0	754.7	751.5	750.8	755.3	759.2	763.7
40°	837.1	801.0	767.5	743.1	727.6	721.8	720.5	723.8	728.9	733.4	738.6
42.5°	791.4	756.0	726.3	703.8	694.1	689.0	690.3	693.5	701.2	707.0	715.4
45°	743.7	714.1	684.5	665.8	656.8	658.1	658.1	663.9	671.0	679.3	687.7
47.5°	699.3	669.0	643.9	627.8	623.3	621.4	624.6	632.3	642.0	651.6	663.2
50°	654.2	625.9	604.6	590.5	585.3	587.3	592.4	599.5	611.7	624.6	636.8
52.5°	608.5	583.4	564.1	551.2	548.0	551.8	557.0	569.2	579.5	593.7	609.1
55°	560.9	539.0	523.5	513.8	512.6	514.5	520.3	532.5	548.0	565.4	579.5
57.5°	513.8	495.2	480.4	473.3	473.9	475.2	484.2	499.0	514.5	533.2	551.2
60°	466.2	449.5	437.9	432.7	433.4	437.2	448.8	462.3	482.9	501.0	520.3
62.5°	421.1	407.0	396.0	391.5	390.2	399.9	410.8	425.0	445.6	466.2	487.4
65°	372.2	360.6	351.6	349.0	350.9	357.4	371.5	390.2	407.6	428.8	450.7
67.5°	324.5	314.9	308.4	309.7	311.7	320.7	332.9	349.0	368.3	390.2	412.8
70°	279.5	270.4	265.3	265.9	269.8	281.4	291.7	307.8	329.0	351.6	369.6
72.5°	233.1	227.9	223.4	226.7	230.5	237.6	251.1	267.2	285.3	305.9	325.2
75°	186.1	186.1	183.5	185.4	191.2	199.0	208.6	225.4	244.0	260.8	276.2
77.5°	146.2	144.2	145.5	147.5	151.3	161.0	171.9	184.2	199.0	216.4	229.2
80°	105.6	106.2	109.5	113.3	114.6	121.7	133.3	144.2	155.2	169.4	181.6
82.5°	72.8	73.4	74.7	79.8	81.1	88.9	95.3	106.2	115.9	124.3	133.9
85°	43.1	43.1	46.4	48.3	51.5	56.7	61.2	67.6	76.6	83.1	92.7
87.5°	20.6	20.6	23.2	24.5	26.4	29.6	30.9	38.0	40.6	43.8	49.6
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: P242646

CATALOG NUMBER: S124DR-S1020D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	1554.4	1554.4	1554.4	1554.4
2.5°	1463.0	1461.7	1457.2	1456.5
5°	1368.3	1365.1	1363.2	1370.3
7.5°	1296.8	1294.3	1288.5	1286.5
10°	1228.6	1226.0	1220.9	1219.6
12.5°	1162.9	1157.1	1157.1	1159.1
15°	1106.2	1103.7	1096.6	1098.5
17.5°	1048.3	1045.7	1036.1	1045.7
20°	994.2	989.1	984.5	983.9
22.5°	942.7	938.2	938.8	933.7
25°	901.5	897.0	895.7	892.5
27.5°	868.0	865.4	862.8	864.1
30°	837.7	837.1	835.8	835.8
32.5°	812.6	812.6	813.9	813.9
35°	789.4	791.4	792.7	790.7
37.5°	768.8	770.1	772.1	774.0
40°	744.4	748.9	750.2	753.4
42.5°	721.2	726.3	730.2	730.2
45°	697.4	702.5	707.0	707.0
47.5°	672.9	680.0	684.5	685.1
50°	647.8	656.8	661.3	664.5
52.5°	623.3	632.3	638.8	640.1
55°	594.3	607.2	614.3	616.9
57.5°	568.6	580.2	587.9	589.8
60°	537.7	550.5	560.9	562.8
62.5°	506.1	519.6	528.7	534.5
65°	468.8	482.3	491.3	493.2
67.5°	429.5	443.7	449.5	453.3
70°	387.6	398.6	405.0	408.2
72.5°	340.0	351.6	359.3	359.3
75°	291.1	301.4	305.2	305.2
77.5°	240.2	246.0	251.1	252.4
80°	191.2	194.5	198.3	198.3
82.5°	141.0	143.6	147.5	146.8
85°	91.4	97.2	96.6	95.3
87.5°	51.5	52.2	54.1	55.4
90°	0.0	0.0	0.0	0.0

(END OF REPORT)