

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: P243496

Luminaire Tested: **S124DR-H1020D830-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P243496
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-H1020D830-X4F0-XX-UDD-A-W
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER.
HIGH PERFORMANCE LIGHT ENGINE
Light Source: (184) 3000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3986.5 lumens
Efficiency: N/A
Efficacy: 126.6 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

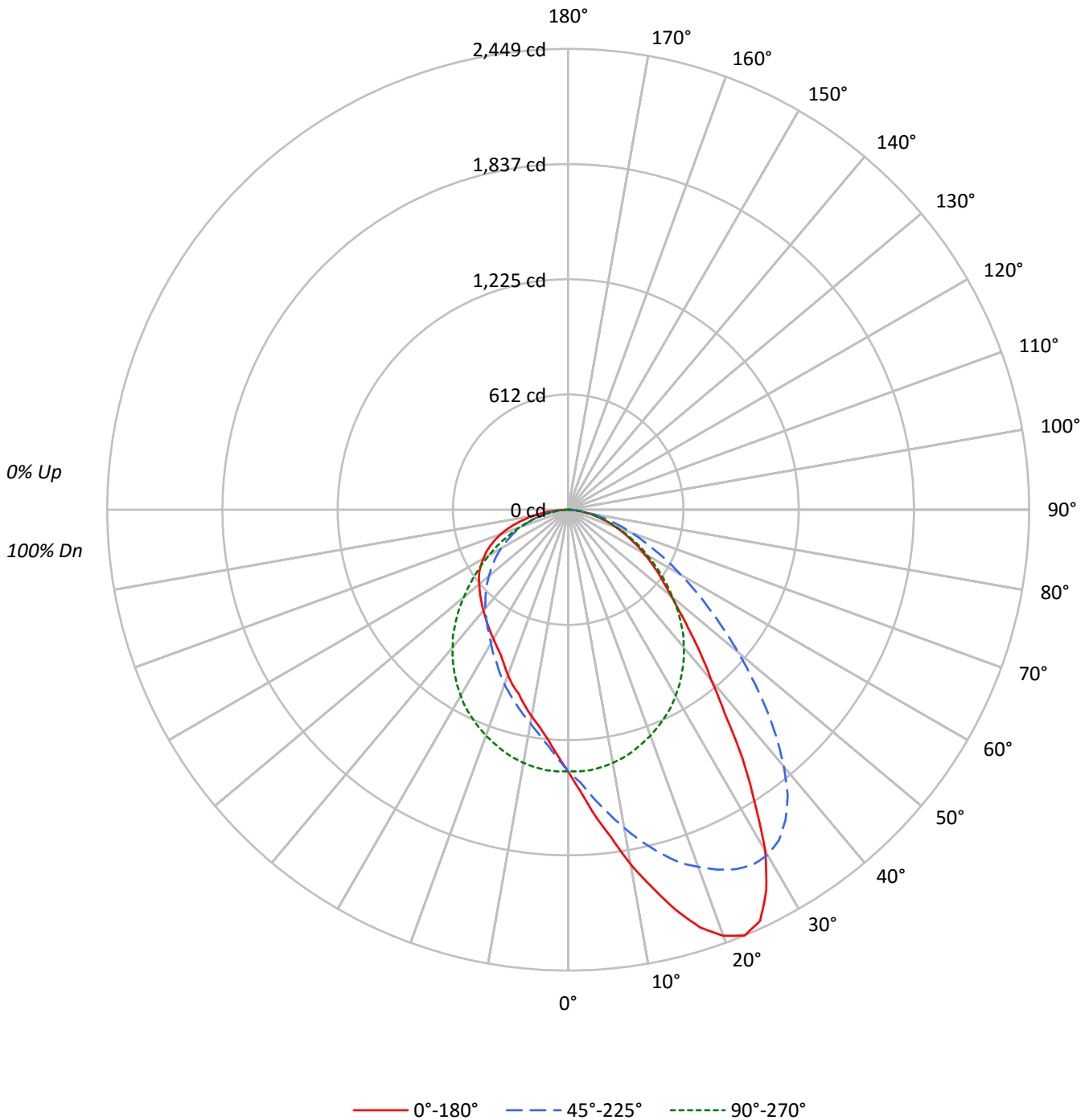
Input Watts (W): 31.5
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	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°	12358	12358	12358
5°	14542	12390	10937
10°	17281	12333	10069
15°	20241	12225	9327
20°	22791	12082	8846
25°	23654	11921	8326
30°	21481	11718	8142
35°	17525	11441	8091
40°	13722	11081	8125
45°	11485	10636	8275
50°	9856	10013	8523
55°	9006	9339	8934
60°	8252	8645	9260
65°	7568	7913	9620
70°	6960	7137	9910
75°	6199	6275	9901
80°	5170	5139	9874
85°	3937	3876	9261



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	135.3	3.4
10°-20°	419.1	10.5
20°-30°	673.3	16.9
30°-40°	769.7	19.3
40°-50°	708.5	17.8
50°-60°	579.5	14.5
60°-70°	413.0	10.4
70°-80°	227.0	5.7
80°-90°	61.0	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°	1227.8	30.8
0°-40°	1997.5	50.1
0°-60°	3285.5	82.4
0°-90°	3986.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3986.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1390	1390	1390	1390	1390	
5°	1630	1537	1389	1255	1226	164
15°	2200	1890	1328	1069	1014	627
25°	2412	2108	1216	899	849	1082
35°	1615	2012	1054	750	746	1004
45°	914	1483	846	618	658	713
55°	581	911	603	482	576	521
65°	360	505	376	338	457	359
75°	180	233	183	187	288	193
85°	39	48	38	52	91	46
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°	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3
2.5°	1497.0	1492.4	1490.1	1487.3	1486.7	1483.9	1478.2	1470.3	1460.1	1449.3	1449.3
5°	1629.7	1628.6	1620.1	1620.7	1609.9	1598.0	1588.9	1577.5	1555.4	1536.7	1523.6
7.5°	1756.8	1768.8	1765.9	1756.8	1741.0	1723.9	1705.8	1689.9	1649.0	1626.3	1607.6
10°	1914.6	1919.1	1911.2	1898.1	1884.0	1851.0	1827.2	1800.5	1756.3	1717.7	1683.6
12.5°	2053.1	2063.8	2049.7	2037.2	2003.7	1979.3	1955.5	1902.1	1855.6	1806.8	1757.4
15°	2199.5	2188.1	2195.5	2164.9	2141.0	2117.8	2057.0	2002.6	1949.8	1889.6	1838.0
17.5°	2326.6	2326.6	2313.0	2293.1	2268.1	2224.4	2163.7	2103.6	2045.1	1966.2	1893.0
20°	2409.4	2415.7	2399.8	2378.8	2348.7	2303.3	2255.1	2189.8	2112.1	2020.2	1937.3
22.5°	2449.1	2450.3	2444.6	2427.0	2402.6	2364.0	2314.7	2251.1	2168.8	2070.1	1983.3
25°	2411.7	2417.9	2416.2	2415.1	2402.6	2380.5	2340.8	2281.7	2206.8	2108.1	2014.5
27.5°	2280.0	2295.4	2308.4	2314.1	2327.7	2328.8	2316.9	2281.2	2219.9	2126.8	2022.4
30°	2092.8	2084.8	2120.0	2137.6	2184.1	2212.0	2231.8	2229.5	2194.4	2118.9	2019.6
32.5°	1843.1	1864.7	1889.6	1931.1	1986.1	2050.8	2099.6	2135.9	2132.5	2083.1	2000.3
35°	1615.0	1615.0	1646.8	1697.8	1756.3	1834.0	1915.7	1983.3	2024.7	2012.2	1953.8
37.5°	1367.6	1382.9	1419.2	1458.9	1530.4	1605.3	1713.2	1802.8	1889.6	1915.7	1885.7
40°	1182.6	1189.4	1228.0	1261.5	1334.7	1412.4	1502.6	1617.3	1717.1	1781.3	1785.2
42.5°	1045.3	1044.7	1060.6	1090.7	1149.7	1218.9	1316.5	1428.9	1545.8	1636.5	1679.1
45°	913.6	912.5	928.9	959.6	1001.6	1062.8	1147.4	1259.8	1379.5	1482.8	1549.7
47.5°	802.4	812.6	820.0	843.8	878.4	930.6	1003.3	1092.9	1208.1	1323.9	1414.1
50°	712.7	717.3	733.2	744.5	783.1	819.4	877.9	958.4	1057.2	1178.6	1276.2
52.5°	641.2	644.1	653.7	668.5	690.6	722.4	768.9	843.2	932.3	1037.9	1138.9
55°	581.1	579.4	585.6	595.3	614.6	641.2	675.3	732.0	809.8	911.3	1004.4
57.5°	522.1	522.1	527.7	534.5	545.3	567.5	600.9	645.8	708.2	798.4	880.7
60°	464.2	468.2	470.4	477.2	486.3	502.8	527.7	562.9	615.7	689.5	771.2
62.5°	413.1	413.1	417.1	419.4	431.3	443.2	461.3	491.4	532.8	598.7	662.2
65°	359.8	363.2	363.2	367.7	377.9	387.0	401.2	423.9	457.9	505.0	564.6
67.5°	314.4	314.4	317.2	319.5	325.2	331.4	343.9	361.5	390.4	427.9	481.8
70°	267.8	269.5	268.4	271.2	274.6	280.9	290.0	304.7	325.7	358.1	397.8
72.5°	225.8	223.6	224.7	227.6	229.3	233.2	238.9	250.2	267.3	293.4	322.3
75°	180.5	179.3	183.3	182.2	185.0	188.4	193.5	202.0	215.1	233.2	255.4
77.5°	140.7	139.0	140.7	141.9	143.0	145.8	149.8	154.9	164.0	175.9	195.8
80°	101.0	100.4	101.6	102.7	103.3	107.8	109.0	114.1	118.0	127.1	136.8
82.5°	67.0	68.1	68.7	69.8	69.2	71.5	72.6	76.0	79.4	84.0	91.4
85°	38.6	36.9	38.6	38.6	38.6	41.4	40.9	43.1	45.4	47.7	52.8
87.5°	13.6	13.6	14.2	14.8	14.8	16.5	15.9	17.0	19.3	19.3	21.0
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°	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3
2.5°	1445.9	1439.6	1435.1	1422.0	1414.1	1406.7	1399.9	1392.5	1384.6	1374.4	1368.1
5°	1510.0	1496.4	1476.5	1458.4	1437.9	1419.8	1405.0	1388.6	1370.4	1351.7	1335.2
7.5°	1580.9	1555.4	1524.8	1491.3	1459.5	1432.8	1405.0	1378.9	1353.4	1328.4	1305.2
10°	1651.9	1607.6	1567.3	1521.4	1479.4	1439.1	1402.8	1366.4	1334.7	1301.7	1272.2
12.5°	1717.7	1664.4	1605.3	1548.0	1491.8	1439.6	1394.8	1350.5	1309.7	1270.5	1235.9
15°	1768.2	1701.2	1631.4	1563.3	1498.7	1444.2	1385.7	1328.4	1285.9	1238.2	1200.2
17.5°	1826.1	1746.6	1677.4	1595.7	1515.1	1427.2	1365.3	1302.9	1251.8	1205.8	1167.8
20°	1864.7	1777.3	1677.4	1584.9	1502.1	1423.2	1348.8	1277.3	1223.4	1170.1	1124.1
22.5°	1895.3	1805.1	1695.0	1598.5	1494.7	1399.4	1318.8	1248.4	1184.9	1134.3	1090.7
25°	1911.2	1801.1	1696.1	1579.2	1475.4	1384.0	1293.2	1215.5	1151.4	1095.2	1057.7
27.5°	1911.8	1798.8	1674.6	1558.8	1447.6	1348.8	1259.2	1182.6	1110.5	1056.6	1011.8
30°	1908.9	1784.1	1653.0	1526.5	1415.8	1314.8	1221.2	1141.7	1075.9	1018.6	976.0
32.5°	1890.8	1763.7	1620.7	1487.9	1367.6	1266.0	1179.7	1100.9	1030.5	978.3	933.5
35°	1849.9	1718.8	1575.3	1438.5	1324.4	1218.9	1133.8	1054.3	991.3	934.6	888.6
37.5°	1797.7	1675.1	1529.3	1386.3	1263.2	1163.3	1083.3	1008.4	942.5	890.3	844.4
40°	1731.9	1616.7	1473.1	1324.4	1201.3	1100.3	1024.8	955.0	898.9	845.5	800.7
42.5°	1641.7	1553.1	1405.6	1260.9	1132.1	1036.7	963.5	905.7	847.8	799.5	754.7
45°	1545.2	1464.6	1333.5	1190.0	1066.3	968.1	899.4	846.1	796.7	747.9	711.6
47.5°	1438.5	1372.7	1251.2	1111.1	989.1	902.3	834.7	787.1	741.7	704.2	667.9
50°	1311.4	1276.8	1163.3	1036.2	917.6	828.5	772.9	724.1	690.6	654.3	620.2
52.5°	1193.4	1165.6	1073.1	948.2	840.4	762.1	702.5	663.9	631.0	604.3	577.1
55°	1065.1	1050.9	972.6	864.8	767.2	688.9	637.8	602.6	576.5	551.6	531.7
57.5°	947.1	946.0	876.7	784.2	688.9	622.5	573.7	544.8	522.1	504.5	487.4
60°	826.2	835.9	779.1	694.6	619.1	556.7	512.4	486.3	471.0	454.5	440.3
62.5°	716.7	731.5	679.8	613.4	539.1	488.0	454.0	434.1	417.1	405.2	394.4
65°	611.7	630.4	588.5	528.9	472.1	423.9	395.0	376.2	363.2	356.4	349.0
67.5°	519.2	529.4	501.1	454.5	407.4	365.4	341.6	325.2	313.8	311.0	302.5
70°	426.7	438.6	418.8	376.2	339.9	309.3	287.7	274.6	267.8	263.9	258.2
72.5°	352.4	357.5	337.6	308.1	279.2	253.7	237.8	228.1	220.2	218.5	215.6
75°	275.8	283.2	267.3	244.6	220.7	202.6	190.7	182.7	178.7	175.9	175.9
77.5°	208.3	214.5	205.4	185.6	171.4	155.5	147.5	140.2	138.5	135.6	136.8
80°	148.1	150.9	145.8	132.2	119.7	111.2	104.4	100.4	99.9	97.6	99.9
82.5°	98.2	98.7	93.1	86.8	77.2	72.6	68.1	66.4	65.8	65.8	64.7
85°	54.5	55.6	51.6	47.7	44.3	40.3	39.2	38.0	36.9	38.6	39.7
87.5°	21.0	21.6	21.0	19.3	18.2	17.0	16.5	17.6	15.9	17.0	17.6
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°	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3	1390.3
2.5°	1358.5	1354.0	1347.1	1335.8	1327.9	1319.3	1315.9	1317.1	1313.7	1309.1	1310.3
5°	1322.7	1309.7	1298.3	1282.5	1267.7	1255.2	1251.2	1246.1	1241.6	1238.8	1235.9
7.5°	1284.7	1266.6	1249.5	1233.7	1216.6	1200.7	1194.5	1190.0	1187.7	1179.7	1176.3
10°	1248.4	1227.4	1207.0	1188.3	1170.7	1153.1	1146.8	1141.2	1133.2	1129.8	1125.8
12.5°	1209.8	1188.8	1166.7	1144.0	1126.4	1112.2	1101.4	1097.5	1089.5	1086.1	1083.8
15°	1172.4	1146.8	1129.2	1111.7	1085.0	1069.1	1064.6	1050.4	1045.8	1039.0	1034.5
17.5°	1134.9	1111.1	1085.0	1064.6	1048.1	1028.2	1017.5	1011.2	1002.7	996.5	987.9
20°	1098.0	1070.2	1049.8	1024.3	1006.1	987.9	974.3	968.7	961.3	952.8	940.8
22.5°	1062.3	1031.6	1011.8	987.9	965.2	944.3	932.9	925.0	910.2	908.5	897.7
25°	1020.3	993.1	966.9	942.0	919.8	898.9	891.5	879.0	873.9	863.7	862.0
27.5°	980.6	951.6	923.3	896.0	876.7	862.0	848.9	841.0	835.9	827.9	828.5
30°	939.1	907.4	880.7	855.7	834.7	820.5	812.0	808.1	800.7	799.5	795.6
32.5°	894.9	865.9	838.1	816.0	794.4	782.0	778.0	774.0	769.5	770.0	768.9
35°	850.6	825.1	795.6	775.1	757.6	750.2	743.9	742.8	741.1	742.2	742.2
37.5°	807.5	779.7	755.3	736.6	726.3	716.1	713.3	712.7	713.3	714.4	717.3
40°	765.5	740.0	716.1	700.8	689.5	684.9	680.9	682.7	684.9	688.9	692.3
42.5°	723.5	699.1	679.2	663.9	653.1	650.9	651.4	654.8	655.4	661.1	667.3
45°	679.2	658.3	639.5	627.6	620.8	618.0	619.1	622.5	626.5	634.4	642.4
47.5°	638.4	619.7	603.2	591.3	586.2	585.0	587.3	591.9	600.9	608.9	618.0
50°	597.0	579.9	564.6	553.8	553.3	549.3	554.4	560.1	570.9	581.6	595.3
52.5°	556.1	539.7	526.6	518.1	515.8	515.8	522.1	532.3	541.9	556.1	568.6
55°	513.5	498.8	486.3	483.5	480.1	481.8	488.6	498.8	512.4	528.3	541.9
57.5°	469.9	457.4	448.3	444.3	442.6	448.3	456.2	467.0	484.6	500.5	515.3
60°	428.4	417.6	408.0	406.9	405.7	413.1	422.8	434.1	451.7	467.6	485.7
62.5°	384.2	375.7	369.4	367.7	367.7	375.1	385.9	400.6	417.1	434.1	453.4
65°	339.3	332.0	330.3	328.0	333.1	337.6	348.4	362.6	380.2	398.9	419.4
67.5°	297.9	293.4	290.0	290.0	293.9	302.5	312.1	326.3	344.4	364.3	382.5
70°	256.5	252.0	249.1	252.0	254.2	264.4	274.6	288.3	305.3	324.6	343.9
72.5°	213.4	213.9	214.5	213.9	216.2	225.8	236.1	249.1	265.6	284.3	301.9
75°	175.3	172.5	173.1	174.2	181.6	186.7	196.9	209.4	227.0	244.0	258.8
77.5°	136.2	135.1	137.9	137.9	144.7	150.9	159.5	171.9	187.3	202.6	214.5
80°	99.9	100.4	102.7	103.3	109.0	115.8	124.8	133.4	147.0	157.8	169.1
82.5°	67.5	68.7	71.5	75.5	77.7	81.7	89.7	98.7	108.4	119.7	126.5
85°	39.2	40.9	43.1	46.0	48.2	52.2	57.9	65.3	72.1	78.3	84.0
87.5°	19.3	19.3	21.0	22.1	23.8	26.1	30.1	32.9	37.5	42.0	44.3
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: P243496

CATALOG NUMBER: S124DR-H1020D830-X4F0-XX-UDD-A-W

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1390.3	1390.3	1390.3	1390.3
2.5°	1308.0	1307.4	1305.2	1306.3
5°	1234.2	1228.5	1228.0	1225.7
7.5°	1170.7	1169.0	1169.0	1164.4
10°	1121.9	1116.8	1117.9	1115.6
12.5°	1075.3	1072.5	1069.1	1065.7
15°	1023.1	1023.1	1023.1	1013.5
17.5°	982.3	981.7	978.9	978.3
20°	939.7	937.4	930.1	935.2
22.5°	896.6	894.9	888.6	889.8
25°	856.3	854.6	853.5	848.9
27.5°	821.7	822.2	823.4	820.5
30°	795.6	793.9	796.1	793.3
32.5°	771.2	771.2	768.9	769.5
35°	743.4	745.6	746.2	745.6
37.5°	719.0	721.8	724.1	721.8
40°	696.3	698.5	700.8	700.2
42.5°	672.4	676.4	678.1	679.8
45°	649.7	654.8	657.7	658.3
47.5°	626.5	632.7	638.4	637.8
50°	603.8	611.7	616.8	616.3
52.5°	581.1	589.0	595.3	598.1
55°	555.5	565.8	571.4	576.5
57.5°	530.0	541.4	547.0	549.3
60°	501.6	511.8	519.2	520.9
62.5°	469.9	480.6	490.3	492.6
65°	436.9	448.9	456.2	457.4
67.5°	398.9	410.3	417.6	421.1
70°	359.8	368.3	376.2	381.3
72.5°	316.1	326.3	333.7	337.1
75°	270.7	282.0	286.0	288.3
77.5°	223.6	230.4	236.6	237.2
80°	176.5	185.0	187.3	192.9
82.5°	129.9	137.9	136.2	138.5
85°	85.7	88.5	90.2	90.8
87.5°	45.4	47.1	48.2	48.8
90°	0.0	0.0	0.0	0.0

(END OF REPORT)