

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: P242641

Luminaire Tested: **S124DR-S1020D835-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P242641
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-S1020D835-X4F0-XX-UDD-A-W
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER
STANDARD LIGHT ENGINE
Light Source: (92) 3500K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4247.4 lumens
Efficiency: N/A
Efficacy: 122.1 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

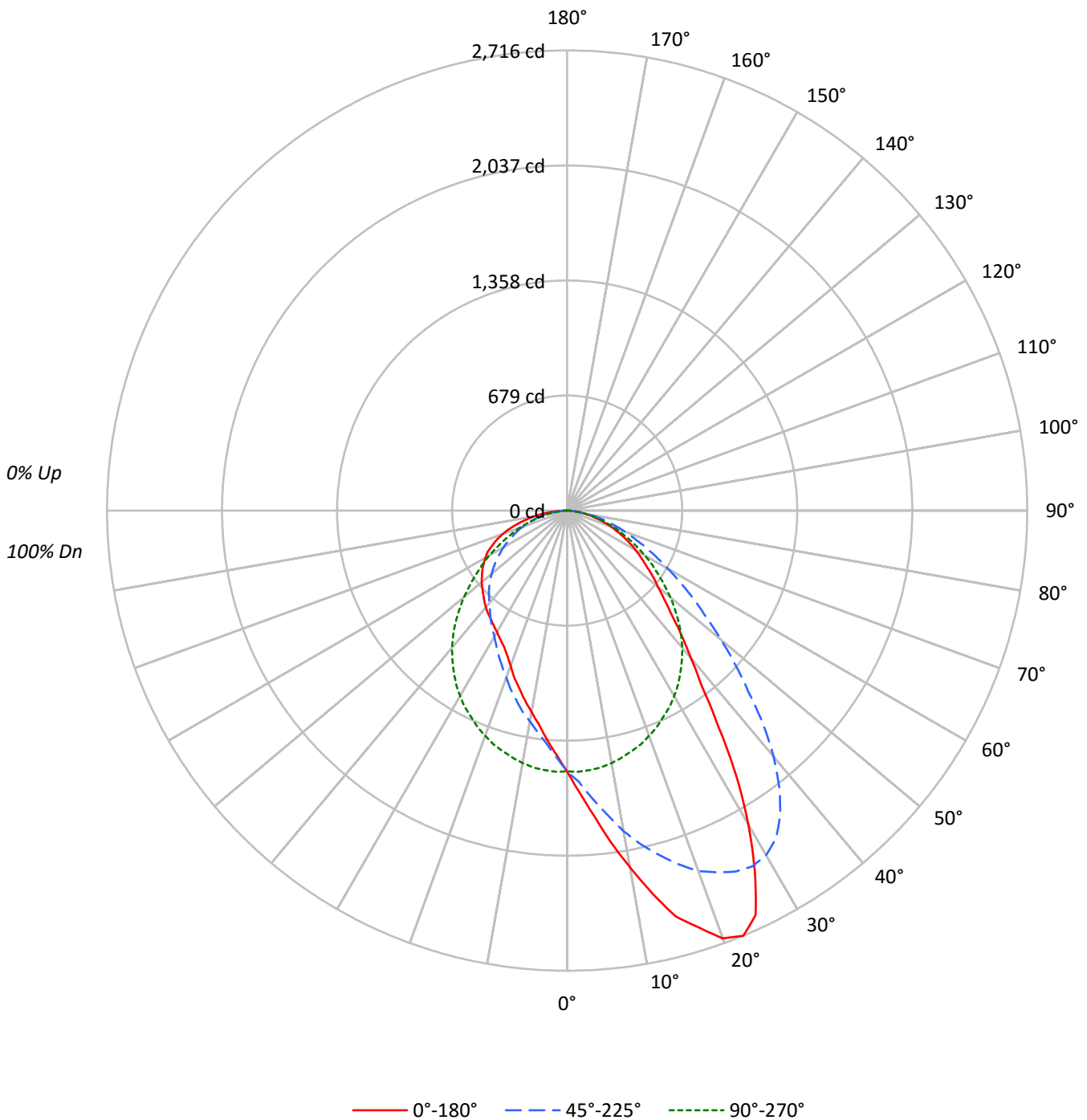
Input Watts (W): 34.8
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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°	13682	13682	13682
5°	16113	13717	12107
10°	19291	13657	10901
15°	22826	13519	10010
20°	25417	13378	9216
25°	25828	13170	8668
30°	21977	12972	8495
35°	16897	12648	8497
40°	13170	12267	8656
45°	10981	11695	8801
50°	9663	10995	9099
55°	8854	10159	9466
60°	8297	9408	9908
65°	7725	8569	10272
70°	7059	7740	10508
75°	6306	6810	10379
80°	5288	5580	10054
85°	3906	4029	9628



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	149.8	3.5
10°-20°	462.4	10.9
20°-30°	734.6	17.3
30°-40°	816.2	19.2
40°-50°	742.3	17.5
50°-60°	606.5	14.3
60°-70°	433.0	10.2
70°-80°	238.2	5.6
80°-90°	64.4	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°	1346.7	31.7
0°-40°	2162.9	50.9
0°-60°	3511.8	82.7
0°-90°	4247.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4247.4	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1539	1539	1539	1539	1539	
5°	1806	1706	1537	1382	1357	183
15°	2480	2105	1469	1158	1088	701
25°	2633	2351	1343	952	884	1168
35°	1557	2193	1166	786	783	986
45°	874	1514	930	652	700	686
55°	571	911	656	510	611	516
65°	367	508	407	354	488	363
75°	184	237	198	197	302	195
85°	38	49	40	56	94	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°	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2
2.5°	1662.9	1662.3	1655.9	1654.6	1650.2	1644.4	1643.2	1633.0	1612.6	1603.0	1600.4
5°	1805.8	1818.5	1801.9	1798.7	1796.8	1775.8	1765.0	1752.2	1722.9	1705.7	1692.3
7.5°	1972.8	1973.5	1966.4	1959.4	1947.3	1929.5	1905.2	1877.2	1843.4	1808.9	1784.7
10°	2137.3	2142.4	2134.1	2132.9	2100.3	2079.9	2039.1	2004.7	1965.2	1921.2	1881.0
12.5°	2310.8	2300.6	2297.4	2263.6	2264.2	2222.8	2173.7	2138.0	2071.7	2019.4	1962.6
15°	2480.4	2466.3	2457.4	2419.8	2401.3	2349.7	2299.3	2260.4	2180.7	2104.8	2047.4
17.5°	2578.6	2595.8	2572.8	2557.5	2507.1	2473.4	2423.0	2343.3	2284.0	2189.6	2123.9
20°	2687.0	2688.2	2676.8	2660.8	2623.2	2577.3	2521.2	2431.9	2357.3	2263.6	2164.1
22.5°	2716.3	2716.3	2713.1	2698.4	2672.3	2637.2	2580.5	2509.7	2415.3	2311.4	2211.9
25°	2633.4	2630.8	2636.6	2653.2	2642.3	2630.8	2598.3	2542.9	2458.7	2350.9	2243.8
27.5°	2398.8	2415.3	2449.8	2490.6	2519.9	2546.0	2544.1	2520.5	2460.6	2367.5	2253.4
30°	2141.2	2162.8	2187.1	2227.9	2306.9	2352.2	2401.9	2439.6	2418.5	2347.7	2243.2
32.5°	1858.0	1859.3	1898.2	1946.0	2016.8	2114.4	2200.5	2286.5	2323.5	2294.8	2211.9
35°	1557.1	1566.0	1604.9	1650.8	1739.4	1845.9	1964.5	2070.4	2157.7	2192.8	2148.2
37.5°	1304.6	1332.6	1362.0	1414.3	1495.2	1591.5	1719.0	1851.0	1979.2	2057.0	2065.3
40°	1135.0	1150.9	1170.7	1208.3	1274.6	1369.0	1474.8	1631.7	1770.1	1895.0	1935.8
42.5°	1001.1	1008.7	1018.9	1052.1	1098.6	1192.4	1286.7	1420.0	1559.0	1714.6	1789.8
45°	873.5	883.1	903.5	923.3	961.5	1026.6	1116.5	1230.0	1369.6	1513.7	1640.0
47.5°	777.9	784.3	797.0	818.7	853.1	897.1	973.7	1069.9	1206.4	1346.0	1481.2
50°	698.8	703.9	713.5	732.6	757.5	795.8	855.7	944.3	1045.7	1186.6	1318.6
52.5°	636.4	637.6	644.0	655.5	674.0	704.6	751.1	820.6	913.1	1034.9	1166.2
55°	571.3	573.9	580.2	589.8	607.0	627.4	665.0	719.9	802.1	911.2	1025.3
57.5°	517.8	520.3	525.4	529.2	544.5	561.7	592.4	631.9	696.3	793.2	897.1
60°	466.7	465.5	471.8	475.0	484.6	498.6	520.9	558.6	612.8	687.4	781.1
62.5°	417.0	415.1	420.2	424.7	429.1	440.6	457.8	485.2	526.7	592.4	670.1
65°	367.3	364.7	367.9	373.0	378.1	384.5	397.9	424.0	459.1	507.6	569.4
67.5°	316.3	319.5	319.5	322.6	325.8	334.8	344.3	364.7	389.6	429.1	484.0
70°	271.6	272.3	274.8	274.8	276.7	284.4	292.0	302.9	327.1	362.8	405.5
72.5°	227.0	230.2	228.3	230.8	232.1	236.6	241.7	251.9	271.6	295.9	330.3
75°	183.6	185.5	185.5	186.2	188.1	190.0	194.5	202.1	216.8	236.6	261.4
77.5°	141.6	141.6	142.8	145.4	145.4	148.6	152.4	158.1	166.4	181.1	197.0
80°	103.3	104.6	103.9	105.2	105.2	107.8	109.0	116.7	119.9	128.8	140.9
82.5°	68.9	70.1	70.1	72.1	73.3	73.3	75.2	77.2	80.3	88.0	91.2
85°	38.3	39.5	38.3	39.5	41.4	42.1	44.0	44.6	47.2	49.1	53.6
87.5°	14.0	15.9	15.9	16.6	17.9	18.5	19.1	18.5	21.0	21.7	24.2
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°	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2
2.5°	1601.1	1592.2	1585.8	1580.7	1566.6	1558.4	1552.0	1543.1	1532.9	1522.0	1508.6
5°	1678.9	1657.2	1641.3	1617.0	1594.1	1574.9	1555.2	1537.3	1515.6	1492.0	1474.8
7.5°	1758.6	1728.6	1688.4	1657.2	1619.6	1587.1	1558.4	1528.4	1496.5	1465.9	1437.2
10°	1833.8	1792.4	1746.5	1692.3	1641.3	1596.0	1553.9	1513.1	1473.6	1434.0	1400.2
12.5°	1914.8	1860.6	1787.3	1721.6	1662.9	1598.5	1545.6	1493.3	1443.6	1401.5	1360.7
15°	1985.6	1911.0	1832.5	1747.7	1672.5	1601.7	1532.2	1469.1	1415.5	1360.7	1322.4
17.5°	2030.2	1937.7	1853.6	1765.0	1678.2	1589.6	1517.6	1446.8	1380.5	1326.9	1279.1
20°	2074.2	1982.4	1870.8	1782.2	1673.8	1582.0	1495.2	1414.3	1344.1	1286.1	1236.4
22.5°	2112.5	2002.8	1891.2	1767.5	1659.7	1560.9	1464.0	1382.4	1310.3	1248.5	1201.3
25°	2121.4	1999.6	1878.4	1762.4	1640.0	1524.6	1438.5	1342.8	1266.3	1201.9	1150.9
27.5°	2124.6	1995.8	1861.2	1735.0	1608.7	1503.5	1391.3	1307.8	1228.7	1160.5	1112.0
30°	2117.6	1981.7	1834.5	1694.8	1567.9	1451.2	1356.9	1263.8	1182.8	1115.2	1064.2
32.5°	2095.2	1952.4	1800.0	1650.2	1517.6	1404.1	1305.9	1218.5	1140.1	1073.8	1019.6
35°	2048.1	1908.4	1747.1	1593.4	1458.9	1343.5	1255.5	1165.6	1086.5	1023.4	971.7
37.5°	1984.9	1854.9	1691.0	1530.9	1401.5	1284.2	1195.6	1112.7	1041.2	976.2	922.6
40°	1896.9	1786.0	1621.5	1466.5	1323.7	1213.4	1131.8	1057.2	986.4	925.8	875.5
42.5°	1795.6	1702.5	1553.9	1387.5	1251.0	1140.1	1061.0	996.0	930.3	875.5	825.1
45°	1671.2	1607.5	1464.6	1312.9	1169.4	1064.8	989.0	930.3	874.2	819.4	777.3
47.5°	1532.9	1497.1	1372.8	1227.4	1089.7	985.1	919.5	863.3	812.3	764.5	726.9
50°	1393.2	1377.9	1274.0	1135.0	1004.9	908.0	841.7	795.1	753.0	712.2	677.2
52.5°	1255.5	1258.7	1167.5	1043.2	925.2	832.7	767.1	724.3	689.3	658.0	627.4
55°	1114.6	1132.4	1059.1	945.6	837.8	753.7	694.4	655.5	630.0	602.6	579.0
57.5°	985.1	1015.1	951.3	847.4	756.2	675.9	623.6	593.6	565.6	547.7	529.2
60°	858.9	886.9	839.8	755.6	670.8	604.5	555.4	529.2	505.6	494.2	482.0
62.5°	746.7	770.9	739.0	662.5	591.7	528.6	489.1	464.2	450.2	437.4	430.4
65°	640.8	661.9	631.9	575.1	512.0	461.0	427.2	407.4	392.1	387.0	378.1
67.5°	536.2	555.4	539.4	489.7	436.1	396.0	369.2	348.1	339.2	334.1	328.4
70°	445.1	464.2	447.0	404.9	366.0	333.5	308.6	297.8	288.2	286.3	277.4
72.5°	367.9	379.4	362.2	331.6	299.7	273.5	255.7	244.2	240.4	236.6	232.7
75°	287.6	299.0	287.6	262.1	238.5	219.3	202.8	198.3	192.6	190.7	187.5
77.5°	215.5	226.4	217.4	200.2	181.7	165.8	156.2	149.8	149.2	145.4	146.7
80°	155.6	162.0	153.7	142.8	128.8	118.6	112.2	109.0	105.2	103.9	106.5
82.5°	100.7	102.7	99.5	93.1	83.5	77.8	74.0	70.1	70.1	70.8	70.1
85°	58.0	57.4	56.7	50.4	47.2	42.7	40.2	39.5	38.9	40.2	41.4
87.5°	24.2	24.9	24.2	21.7	19.8	17.9	17.2	16.6	17.2	17.9	18.5
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):

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2	1539.2
2.5°	1502.2	1496.5	1488.2	1476.7	1467.2	1457.0	1454.4	1450.6	1458.3	1451.9	1450.0
5°	1460.2	1446.8	1429.6	1409.8	1398.3	1381.7	1378.5	1372.2	1365.8	1365.2	1358.8
7.5°	1416.2	1397.7	1376.0	1355.6	1337.7	1319.9	1308.4	1307.1	1296.9	1291.8	1285.5
10°	1374.1	1349.9	1323.7	1304.6	1282.9	1263.8	1250.4	1242.7	1236.4	1229.3	1223.0
12.5°	1324.4	1298.2	1277.8	1256.8	1230.0	1216.6	1192.4	1177.7	1177.7	1179.6	1160.5
15°	1288.0	1262.5	1229.3	1200.0	1186.0	1157.9	1145.8	1130.5	1120.9	1111.4	1103.7
17.5°	1243.4	1212.1	1186.6	1153.5	1127.3	1106.3	1089.7	1081.4	1066.1	1052.1	1042.5
20°	1201.9	1168.1	1140.7	1105.0	1075.7	1048.3	1034.9	1022.1	1011.3	999.8	989.0
22.5°	1159.8	1124.1	1089.1	1054.6	1027.9	998.5	985.8	967.3	957.1	952.0	941.1
25°	1115.2	1077.0	1038.7	1005.5	977.5	952.0	934.8	921.4	909.9	904.8	897.8
27.5°	1066.7	1029.1	992.8	954.5	922.0	903.5	889.5	878.7	871.6	864.0	860.8
30°	1020.8	981.3	941.8	906.7	877.4	858.9	846.1	839.1	834.0	830.8	827.6
32.5°	974.3	935.4	893.3	862.1	836.6	820.6	811.7	804.7	802.8	802.1	801.5
35°	923.9	884.4	846.1	817.4	792.6	786.2	777.9	774.1	772.8	777.3	779.2
37.5°	875.5	838.5	802.8	774.1	757.5	747.3	744.1	743.5	747.9	751.8	756.2
40°	828.9	793.2	760.1	735.8	720.5	714.8	713.5	716.7	721.8	726.3	731.4
42.5°	783.6	748.6	719.2	696.9	687.4	682.3	683.5	686.7	694.4	700.1	708.4
45°	736.5	707.1	677.8	659.3	650.4	651.7	651.7	657.4	664.4	672.7	681.0
47.5°	692.5	662.5	637.6	621.7	617.2	615.3	618.5	626.1	635.7	645.3	656.8
50°	647.8	619.8	598.7	584.7	579.6	581.5	586.6	593.6	605.7	618.5	630.6
52.5°	602.6	577.7	558.6	545.8	542.6	546.4	551.5	563.7	573.9	587.9	603.2
55°	555.4	533.7	518.4	508.8	507.6	509.5	515.2	527.3	542.6	559.8	573.9
57.5°	508.8	490.3	475.7	468.7	469.3	470.6	479.5	494.2	509.5	528.0	545.8
60°	461.6	445.1	433.6	428.5	429.1	432.9	444.4	457.8	478.2	496.1	515.2
62.5°	417.0	403.0	392.1	387.7	386.4	396.0	406.8	420.8	441.2	461.6	482.7
65°	368.5	357.1	348.1	345.6	347.5	353.9	367.9	386.4	403.6	424.7	446.3
67.5°	321.4	311.8	305.4	306.7	308.6	317.5	329.7	345.6	364.7	386.4	408.7
70°	276.7	267.8	262.7	263.3	267.2	278.6	288.8	304.8	325.8	348.1	366.0
72.5°	230.8	225.7	221.3	224.4	228.3	235.3	248.7	264.6	282.5	302.9	322.0
75°	184.3	184.3	181.7	183.6	189.4	197.0	206.6	223.2	241.7	258.2	273.5
77.5°	144.7	142.8	144.1	146.0	149.8	159.4	170.2	182.4	197.0	214.2	227.0
80°	104.6	105.2	108.4	112.2	113.5	120.5	132.0	142.8	153.7	167.7	179.8
82.5°	72.1	72.7	74.0	79.1	80.3	88.0	94.4	105.2	114.8	123.1	132.6
85°	42.7	42.7	45.9	47.8	51.0	56.1	60.6	67.0	75.9	82.3	91.8
87.5°	20.4	20.4	23.0	24.2	26.1	29.3	30.6	37.6	40.2	43.4	49.1
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: P242641

CATALOG NUMBER: S124DR-S1020D835-X4F0-XX-UDD-A-W

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1539.2	1539.2	1539.2	1539.2
2.5°	1448.7	1447.4	1442.9	1442.3
5°	1355.0	1351.8	1349.9	1356.9
7.5°	1284.2	1281.6	1275.9	1274.0
10°	1216.6	1214.0	1208.9	1207.7
12.5°	1151.6	1145.8	1145.8	1147.7
15°	1095.4	1092.9	1085.9	1087.8
17.5°	1038.1	1035.5	1025.9	1035.5
20°	984.5	979.4	974.9	974.3
22.5°	933.5	929.0	929.7	924.6
25°	892.7	888.2	886.9	883.8
27.5°	859.5	857.0	854.4	855.7
30°	829.6	828.9	827.6	827.6
32.5°	804.7	804.7	806.0	806.0
35°	781.7	783.6	784.9	783.0
37.5°	761.3	762.6	764.5	766.4
40°	737.1	741.6	742.8	746.0
42.5°	714.1	719.2	723.1	723.1
45°	690.6	695.7	700.1	700.1
47.5°	666.3	673.3	677.8	678.4
50°	641.5	650.4	654.8	658.0
52.5°	617.2	626.1	632.5	633.8
55°	588.5	601.3	608.3	610.8
57.5°	563.0	574.5	582.2	584.1
60°	532.4	545.2	555.4	557.3
62.5°	501.2	514.6	523.5	529.2
65°	464.2	477.6	486.5	488.4
67.5°	425.3	439.3	445.1	448.9
70°	383.9	394.7	401.1	404.3
72.5°	336.7	348.1	355.8	355.8
75°	288.2	298.4	302.2	302.2
77.5°	237.8	243.6	248.7	249.9
80°	189.4	192.6	196.4	196.4
82.5°	139.6	142.2	146.0	145.4
85°	90.5	96.3	95.6	94.4
87.5°	51.0	51.6	53.6	54.8
90°	0.0	0.0	0.0	0.0

(END OF REPORT)