

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: P242636

Luminaire Tested: **S124DR-S1020D830-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P242636  
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-S1020D830-X4F0-XX-UDD-A-W  
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER  
STANDARD LIGHT ENGINE  
Light Source: (92) 3000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4003.3 lumens  
Efficiency: N/A  
Efficacy: 115.0 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

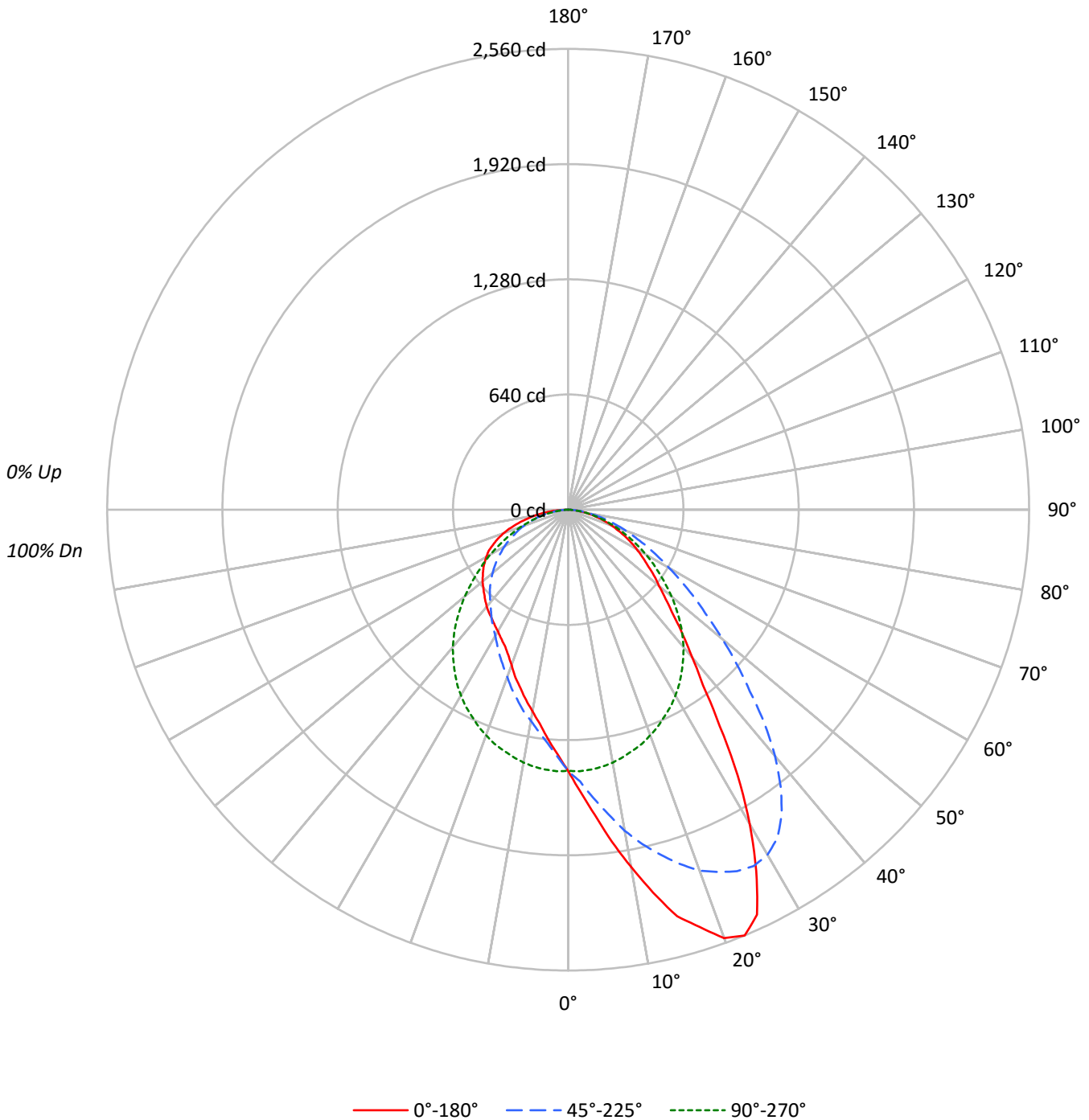
Input Watts (W): 34.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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°	12896	12896	12896
5°	15187	12929	11411
10°	18183	12873	10274
15°	21514	12743	9435
20°	23957	12609	8687
25°	24344	12414	8170
30°	20714	12227	8007
35°	15925	11921	8008
40°	12414	11562	8160
45°	10351	11022	8295
50°	9109	10363	8577
55°	8345	9574	8922
60°	7820	8868	9339
65°	7282	8077	9684
70°	6653	7295	9902
75°	5945	6419	9785
80°	4986	5262	9475
85°	3682	3804	9067



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	141.2	3.5
10°-20°	435.8	10.9
20°-30°	692.4	17.3
30°-40°	769.3	19.2
40°-50°	699.6	17.5
50°-60°	571.7	14.3
60°-70°	408.1	10.2
70°-80°	224.5	5.6
80°-90°	60.7	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°	1269.4	31.7
0°-40°	2038.7	50.9
0°-60°	3310.0	82.7
0°-90°	4003.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4003.3	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1451	1451	1451	1451	1451	
5°	1702	1608	1449	1302	1279	172
15°	2338	1984	1385	1091	1025	661
25°	2482	2216	1266	897	833	1101
35°	1468	2067	1099	741	738	929
45°	823	1427	877	614	660	647
55°	538	859	618	480	576	486
65°	346	478	384	334	460	343
75°	173	223	187	186	285	184
85°	36	46	37	53	89	44
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°	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8
2.5°	1567.4	1566.8	1560.8	1559.6	1555.4	1550.0	1548.8	1539.1	1519.9	1510.9	1508.5
5°	1702.0	1714.0	1698.4	1695.4	1693.6	1673.8	1663.5	1651.5	1623.9	1607.6	1595.0
7.5°	1859.5	1860.1	1853.5	1846.8	1835.4	1818.6	1795.8	1769.3	1737.5	1705.0	1682.2
10°	2014.5	2019.3	2011.5	2010.3	1979.7	1960.4	1922.0	1889.5	1852.3	1810.8	1772.9
12.5°	2178.0	2168.4	2165.4	2133.5	2134.1	2095.1	2048.8	2015.1	1952.6	1903.3	1849.8
15°	2337.9	2324.6	2316.2	2280.8	2263.3	2214.7	2167.2	2130.5	2055.4	1983.9	1929.8
17.5°	2430.4	2446.6	2425.0	2410.6	2363.1	2331.2	2283.8	2208.6	2152.7	2063.8	2001.9
20°	2532.6	2533.8	2523.0	2507.9	2472.5	2429.2	2376.3	2292.2	2221.9	2133.5	2039.8
22.5°	2560.2	2560.2	2557.2	2543.4	2518.8	2485.7	2432.2	2365.5	2276.6	2178.6	2084.8
25°	2482.1	2479.7	2485.1	2500.7	2490.5	2479.7	2449.0	2396.8	2317.4	2215.9	2114.9
27.5°	2260.9	2276.6	2309.0	2347.5	2375.1	2399.8	2398.0	2375.7	2319.2	2231.5	2123.9
30°	2018.1	2038.6	2061.4	2099.9	2174.4	2217.1	2263.9	2299.4	2279.6	2212.8	2114.3
32.5°	1751.3	1752.5	1789.1	1834.2	1900.9	1992.9	2074.0	2155.2	2190.0	2163.0	2084.8
35°	1467.6	1476.0	1512.7	1556.0	1639.5	1739.9	1851.7	1951.4	2033.8	2066.8	2024.7
37.5°	1229.6	1256.1	1283.7	1333.0	1409.3	1500.1	1620.3	1744.7	1865.5	1938.8	1946.6
40°	1069.8	1084.8	1103.4	1138.9	1201.4	1290.3	1390.1	1537.9	1668.3	1786.1	1824.6
42.5°	943.6	950.8	960.4	991.6	1035.5	1123.9	1212.8	1338.4	1469.4	1616.1	1687.0
45°	823.4	832.4	851.6	870.2	906.3	967.6	1052.3	1159.3	1290.9	1426.8	1545.7
47.5°	733.2	739.2	751.2	771.7	804.1	845.6	917.7	1008.5	1137.1	1268.7	1396.1
50°	658.7	663.5	672.5	690.5	714.0	750.0	806.5	890.1	985.6	1118.4	1242.8
52.5°	599.8	601.0	607.0	617.8	635.2	664.1	708.0	773.5	860.6	975.4	1099.2
55°	538.5	540.9	546.9	555.9	572.1	591.4	626.8	678.5	756.0	858.8	966.4
57.5°	488.0	490.4	495.2	498.8	513.2	529.5	558.3	595.6	656.3	747.6	845.6
60°	439.9	438.7	444.7	447.7	456.8	470.0	491.0	526.5	577.6	647.9	736.2
62.5°	393.0	391.2	396.1	400.3	404.5	415.3	431.5	457.4	496.4	558.3	631.6
65°	346.2	343.8	346.8	351.6	356.4	362.4	375.0	399.7	432.7	478.4	536.7
67.5°	298.1	301.1	301.1	304.1	307.1	315.5	324.5	343.8	367.2	404.5	456.2
70°	256.0	256.6	259.0	259.0	260.8	268.0	275.3	285.5	308.3	342.0	382.2
72.5°	214.0	217.0	215.2	217.6	218.8	223.0	227.8	237.4	256.0	278.9	311.3
75°	173.1	174.9	174.9	175.5	177.3	179.1	183.3	190.5	204.3	223.0	246.4
77.5°	133.4	133.4	134.6	137.0	137.0	140.0	143.6	149.0	156.9	170.7	185.7
80°	97.4	98.6	98.0	99.2	99.2	101.6	102.8	110.0	113.0	121.4	132.8
82.5°	64.9	66.1	66.1	67.9	69.1	69.1	70.9	72.7	75.7	82.9	85.9
85°	36.1	37.3	36.1	37.3	39.1	39.7	41.5	42.1	44.5	46.3	50.5
87.5°	13.2	15.0	15.0	15.6	16.8	17.4	18.0	17.4	19.8	20.4	22.8
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°	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8
2.5°	1509.1	1500.7	1494.7	1489.9	1476.6	1468.8	1462.8	1454.4	1444.8	1434.6	1421.9
5°	1582.4	1562.0	1546.9	1524.1	1502.5	1484.4	1465.8	1449.0	1428.6	1406.3	1390.1
7.5°	1657.5	1629.3	1591.4	1562.0	1526.5	1495.9	1468.8	1440.6	1410.5	1381.7	1354.6
10°	1728.4	1689.4	1646.1	1595.0	1546.9	1504.3	1464.6	1426.2	1388.9	1351.6	1319.8
12.5°	1804.8	1753.7	1684.6	1622.7	1567.4	1506.7	1456.8	1407.5	1360.6	1321.0	1282.5
15°	1871.5	1801.2	1727.2	1647.3	1576.4	1509.7	1444.2	1384.7	1334.2	1282.5	1246.5
17.5°	1913.6	1826.4	1747.1	1663.5	1581.8	1498.3	1430.4	1363.6	1301.1	1250.7	1205.6
20°	1955.0	1868.5	1763.3	1679.8	1577.6	1491.1	1409.3	1333.0	1266.9	1212.2	1165.3
22.5°	1991.1	1887.7	1782.5	1665.9	1564.4	1471.2	1379.9	1302.9	1235.0	1176.7	1132.3
25°	1999.5	1884.7	1770.5	1661.1	1545.7	1437.0	1355.8	1265.7	1193.6	1132.9	1084.8
27.5°	2002.5	1881.1	1754.3	1635.3	1516.3	1417.1	1311.4	1232.6	1158.1	1093.8	1048.1
30°	1995.9	1867.9	1729.0	1597.4	1477.8	1367.9	1278.9	1191.2	1114.8	1051.1	1003.1
32.5°	1974.9	1840.2	1696.6	1555.4	1430.4	1323.4	1230.8	1148.5	1074.6	1012.1	961.0
35°	1930.4	1798.8	1646.7	1501.9	1375.1	1266.3	1183.4	1098.6	1024.1	964.6	915.9
37.5°	1870.9	1748.3	1593.8	1443.0	1321.0	1210.4	1126.9	1048.7	981.4	920.1	869.6
40°	1787.9	1683.4	1528.3	1382.3	1247.7	1143.7	1066.8	996.4	929.7	872.6	825.2
42.5°	1692.4	1604.6	1464.6	1307.8	1179.1	1074.6	1000.0	938.7	876.8	825.2	777.7
45°	1575.2	1515.1	1380.5	1237.4	1102.2	1003.7	932.1	876.8	824.0	772.3	732.6
47.5°	1444.8	1411.1	1293.9	1156.9	1027.1	928.5	866.6	813.7	765.7	720.6	685.1
50°	1313.2	1298.7	1200.8	1069.8	947.2	855.8	793.3	749.4	709.8	671.3	638.3
52.5°	1183.4	1186.4	1100.4	983.2	872.0	784.9	723.0	682.7	649.7	620.2	591.4
55°	1050.5	1067.4	998.2	891.3	789.7	710.4	654.5	617.8	593.8	567.9	545.7
57.5°	928.5	956.8	896.7	798.7	712.8	637.1	587.8	559.5	533.1	516.3	498.8
60°	809.5	836.0	791.5	712.2	632.2	569.7	523.5	498.8	476.6	465.8	454.3
62.5°	703.8	726.6	696.5	624.4	557.7	498.2	461.0	437.5	424.3	412.3	405.7
65°	604.0	623.8	595.6	542.1	482.6	434.5	402.7	384.0	369.6	364.8	356.4
67.5°	505.4	523.5	508.4	461.6	411.1	373.2	348.0	328.1	319.7	314.9	309.5
70°	419.5	437.5	421.3	381.6	345.0	314.3	290.9	280.7	271.6	269.8	261.4
72.5°	346.8	357.6	341.4	312.5	282.5	257.8	241.0	230.2	226.6	223.0	219.4
75°	271.0	281.9	271.0	247.0	224.8	206.7	191.1	186.9	181.5	179.7	176.7
77.5°	203.1	213.4	204.9	188.7	171.3	156.3	147.2	141.2	140.6	137.0	138.2
80°	146.6	152.7	144.8	134.6	121.4	111.8	105.8	102.8	99.2	98.0	100.4
82.5°	95.0	96.8	93.8	87.7	78.7	73.3	69.7	66.1	66.1	66.7	66.1
85°	54.7	54.1	53.5	47.5	44.5	40.3	37.9	37.3	36.7	37.9	39.1
87.5°	22.8	23.4	22.8	20.4	18.6	16.8	16.2	15.6	16.2	16.8	17.4
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°	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8	1450.8
2.5°	1415.9	1410.5	1402.7	1391.9	1382.9	1373.3	1370.9	1367.3	1374.5	1368.5	1366.7
5°	1376.3	1363.6	1347.4	1328.8	1318.0	1302.3	1299.3	1293.3	1287.3	1286.7	1280.7
7.5°	1334.8	1317.4	1296.9	1277.7	1260.9	1244.1	1233.2	1232.0	1222.4	1217.6	1211.6
10°	1295.1	1272.3	1247.7	1229.6	1209.2	1191.2	1178.5	1171.3	1165.3	1158.7	1152.7
12.5°	1248.3	1223.6	1204.4	1184.6	1159.3	1146.7	1123.9	1110.0	1110.0	1111.8	1093.8
15°	1214.0	1190.0	1158.7	1131.1	1117.8	1091.4	1080.0	1065.6	1056.5	1047.5	1040.3
17.5°	1171.9	1142.5	1118.4	1087.2	1062.6	1042.7	1027.1	1019.3	1004.9	991.6	982.6
20°	1132.9	1101.0	1075.2	1041.5	1013.9	988.0	975.4	963.4	953.2	942.4	932.1
22.5°	1093.2	1059.5	1026.5	994.0	968.8	941.2	929.1	911.7	902.1	897.3	887.1
25°	1051.1	1015.1	979.0	947.8	921.3	897.3	881.1	868.4	857.6	852.8	846.2
27.5°	1005.5	970.0	935.7	899.7	869.0	851.6	838.4	828.2	821.6	814.3	811.3
30°	962.2	924.9	887.7	854.6	827.0	809.5	797.5	790.9	786.1	783.1	780.1
32.5°	918.3	881.7	842.0	812.5	788.5	773.5	765.1	758.5	756.6	756.0	755.4
35°	870.8	833.6	797.5	770.5	747.0	741.0	733.2	729.6	728.4	732.6	734.4
37.5°	825.2	790.3	756.6	729.6	714.0	704.4	701.4	700.8	705.0	708.6	712.8
40°	781.3	747.6	716.4	693.5	679.1	673.7	672.5	675.5	680.3	684.5	689.3
42.5°	738.6	705.6	677.9	656.9	647.9	643.1	644.3	647.3	654.5	659.9	667.7
45°	694.1	666.5	638.9	621.4	613.0	614.2	614.2	619.6	626.2	634.0	641.9
47.5°	652.7	624.4	601.0	586.0	581.8	580.0	583.0	590.2	599.2	608.2	619.0
50°	610.6	584.2	564.3	551.1	546.3	548.1	552.9	559.5	570.9	583.0	594.4
52.5°	567.9	544.5	526.5	514.4	511.4	515.0	519.9	531.3	540.9	554.1	568.5
55°	523.5	503.0	488.6	479.6	478.4	480.2	485.6	497.0	511.4	527.7	540.9
57.5°	479.6	462.2	448.3	441.7	442.3	443.5	451.9	465.8	480.2	497.6	514.4
60°	435.1	419.5	408.7	403.9	404.5	408.1	418.9	431.5	450.7	467.6	485.6
62.5°	393.0	379.8	369.6	365.4	364.2	373.2	383.4	396.7	415.9	435.1	454.9
65°	347.4	336.6	328.1	325.7	327.5	333.5	346.8	364.2	380.4	400.3	420.7
67.5°	302.9	293.9	287.9	289.1	290.9	299.3	310.7	325.7	343.8	364.2	385.2
70°	260.8	252.4	247.6	248.2	251.8	262.6	272.2	287.3	307.1	328.1	345.0
72.5°	217.6	212.8	208.5	211.5	215.2	221.8	234.4	249.4	266.2	285.5	303.5
75°	173.7	173.7	171.3	173.1	178.5	185.7	194.7	210.3	227.8	243.4	257.8
77.5°	136.4	134.6	135.8	137.6	141.2	150.2	160.5	171.9	185.7	201.9	214.0
80°	98.6	99.2	102.2	105.8	107.0	113.6	124.4	134.6	144.8	158.1	169.5
82.5°	67.9	68.5	69.7	74.5	75.7	82.9	88.9	99.2	108.2	116.0	125.0
85°	40.3	40.3	43.3	45.1	48.1	52.9	57.1	63.1	71.5	77.5	86.5
87.5°	19.2	19.2	21.6	22.8	24.6	27.6	28.8	35.5	37.9	40.9	46.3
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: P242636

CATALOG NUMBER: S124DR-S1020D830-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	1450.8	1450.8	1450.8	1450.8
2.5°	1365.5	1364.2	1360.0	1359.4
5°	1277.1	1274.1	1272.3	1278.9
7.5°	1210.4	1208.0	1202.6	1200.8
10°	1146.7	1144.3	1139.5	1138.3
12.5°	1085.4	1080.0	1080.0	1081.8
15°	1032.5	1030.1	1023.5	1025.3
17.5°	978.4	976.0	967.0	976.0
20°	927.9	923.1	918.9	918.3
22.5°	879.9	875.6	876.2	871.4
25°	841.4	837.2	836.0	833.0
27.5°	810.1	807.7	805.3	806.5
30°	781.9	781.3	780.1	780.1
32.5°	758.5	758.5	759.7	759.7
35°	736.8	738.6	739.8	738.0
37.5°	717.6	718.8	720.6	722.4
40°	694.7	699.0	700.2	703.2
42.5°	673.1	677.9	681.5	681.5
45°	650.9	655.7	659.9	659.9
47.5°	628.0	634.6	638.9	639.5
50°	604.6	613.0	617.2	620.2
52.5°	581.8	590.2	596.2	597.4
55°	554.7	566.7	573.3	575.7
57.5°	530.7	541.5	548.7	550.5
60°	501.8	513.8	523.5	525.3
62.5°	472.4	485.0	493.4	498.8
65°	437.5	450.1	458.6	460.4
67.5°	400.9	414.1	419.5	423.1
70°	361.8	372.0	378.0	381.0
72.5°	317.3	328.1	335.4	335.4
75°	271.6	281.3	284.9	284.9
77.5°	224.2	229.6	234.4	235.6
80°	178.5	181.5	185.1	185.1
82.5°	131.6	134.0	137.6	137.0
85°	85.3	90.7	90.1	88.9
87.5°	48.1	48.7	50.5	51.7
90°	0.0	0.0	0.0	0.0

(END OF REPORT)