

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: P243511

Luminaire Tested: **S124DR-H1020D930-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P243511
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-H1020D930-X4F0-XX-UDD-A-W
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER.
HIGH PERFORMANCE LIGHT ENGINE
Light Source: (184) 3000K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3448.3 lumens
Efficiency: N/A
Efficacy: 109.5 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

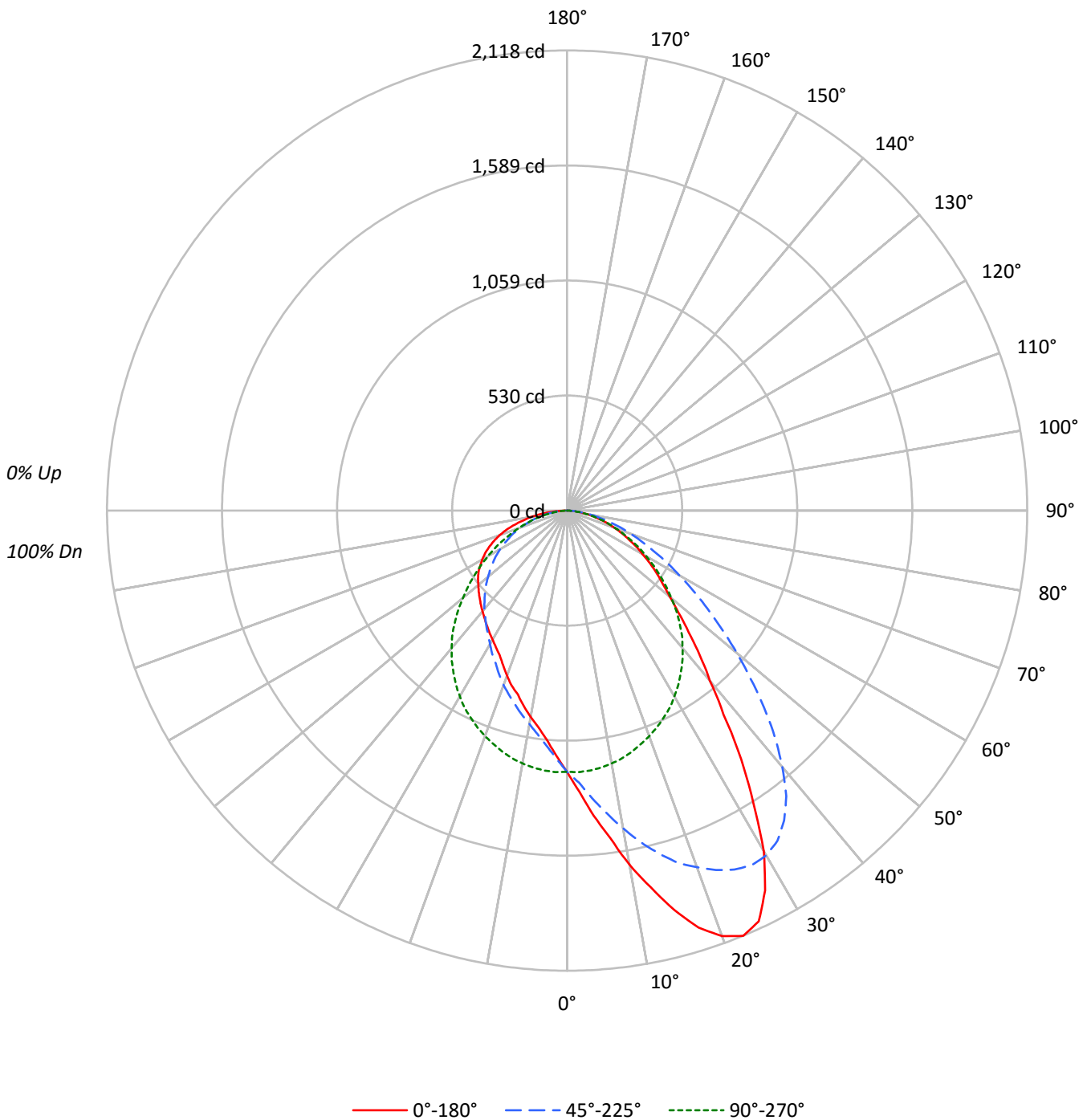
Input Watts (W): 31.5
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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°	10690	10690	10690
5°	12579	10717	9460
10°	14948	10669	8710
15°	17508	10575	8068
20°	19715	10452	7652
25°	20460	10312	7202
30°	18581	10137	7043
35°	15159	9896	6999
40°	11869	9586	7028
45°	9935	9201	7158
50°	8525	8661	7372
55°	7789	8079	7729
60°	7138	7479	8011
65°	6545	6844	8321
70°	6022	6175	8574
75°	5361	5430	8565
80°	4474	4448	8543
85°	3406	3355	8006



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	117.1	3.4
10°-20°	362.5	10.5
20°-30°	582.4	16.9
30°-40°	665.8	19.3
40°-50°	612.9	17.8
50°-60°	501.3	14.5
60°-70°	357.3	10.4
70°-80°	196.3	5.7
80°-90°	52.8	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°	1062.0	30.8
0°-40°	1727.8	50.1
0°-60°	2842.0	82.4
0°-90°	3448.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3448.3	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1203	1203	1203	1203	1203	
5°	1410	1329	1201	1086	1060	142
15°	1902	1634	1149	925	877	542
25°	2086	1824	1051	778	734	936
35°	1397	1741	912	649	645	868
45°	790	1283	732	534	569	617
55°	503	788	521	417	499	451
65°	311	437	325	292	396	311
75°	156	202	158	162	249	167
85°	33	41	33	45	78	40
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°	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6
2.5°	1294.9	1290.9	1289.0	1286.5	1286.0	1283.6	1278.7	1271.8	1263.0	1253.6	1253.6
5°	1409.7	1408.7	1401.4	1401.9	1392.5	1382.2	1374.4	1364.6	1345.4	1329.2	1317.9
7.5°	1519.7	1530.0	1527.5	1519.7	1505.9	1491.2	1475.5	1461.8	1426.4	1406.8	1390.6
10°	1656.1	1660.1	1653.2	1641.9	1629.6	1601.2	1580.5	1557.5	1519.2	1485.8	1456.4
12.5°	1775.9	1785.2	1773.0	1762.2	1733.2	1712.1	1691.5	1645.3	1605.1	1562.9	1520.2
15°	1902.5	1892.7	1899.1	1872.6	1852.0	1831.9	1779.3	1732.2	1686.6	1634.5	1589.9
17.5°	2012.5	2012.5	2000.7	1983.5	1961.9	1924.1	1871.6	1819.6	1769.0	1700.8	1637.5
20°	2084.2	2089.6	2075.8	2057.6	2031.6	1992.4	1950.6	1894.2	1826.9	1747.4	1675.8
22.5°	2118.5	2119.5	2114.6	2099.4	2078.3	2044.9	2002.2	1947.2	1876.0	1790.6	1715.5
25°	2086.1	2091.5	2090.0	2089.1	2078.3	2059.1	2024.8	1973.7	1908.9	1823.5	1742.5
27.5°	1972.2	1985.5	1996.8	2001.7	2013.5	2014.5	2004.1	1973.2	1920.2	1839.7	1749.4
30°	1810.3	1803.4	1833.8	1849.0	1889.3	1913.3	1930.5	1928.6	1898.1	1832.8	1746.9
32.5°	1594.3	1612.9	1634.5	1670.4	1718.0	1773.9	1816.1	1847.6	1844.6	1801.9	1730.3
35°	1397.0	1397.0	1424.5	1468.6	1519.2	1586.4	1657.1	1715.5	1751.4	1740.6	1690.0
37.5°	1183.0	1196.2	1227.6	1262.0	1323.8	1388.6	1481.9	1559.4	1634.5	1657.1	1631.1
40°	1022.9	1028.8	1062.2	1091.2	1154.5	1221.7	1299.8	1398.9	1485.3	1540.8	1544.2
42.5°	904.1	903.7	917.4	943.4	994.5	1054.3	1138.8	1236.0	1337.1	1415.6	1452.4
45°	790.3	789.3	803.5	830.0	866.4	919.4	992.5	1089.7	1193.3	1282.6	1340.5
47.5°	694.1	702.9	709.3	729.9	759.8	805.0	867.8	945.4	1045.0	1145.2	1223.2
50°	616.5	620.4	634.2	644.0	677.4	708.8	759.3	829.0	914.5	1019.5	1103.9
52.5°	554.7	557.1	565.5	578.2	597.4	624.9	665.1	729.4	806.5	897.8	985.1
55°	502.6	501.2	506.6	514.9	531.6	554.7	584.1	633.2	700.4	788.3	868.8
57.5°	451.6	451.6	456.5	462.4	471.7	490.9	519.8	558.6	612.6	690.6	761.8
60°	401.5	405.0	406.9	412.8	420.7	434.9	456.5	486.9	532.6	596.4	667.1
62.5°	357.3	357.3	360.8	362.7	373.0	383.4	399.1	425.1	460.9	517.8	572.8
65°	311.2	314.1	314.1	318.1	326.9	334.8	347.0	366.7	396.1	436.9	488.4
67.5°	271.9	271.9	274.4	276.3	281.3	286.7	297.5	312.7	337.7	370.1	416.7
70°	231.7	233.2	232.2	234.6	237.6	243.0	250.8	263.6	281.7	309.7	344.1
72.5°	195.4	193.4	194.4	196.8	198.3	201.7	206.6	216.5	231.2	253.8	278.8
75°	156.1	155.1	158.5	157.6	160.0	163.0	167.4	174.7	186.0	201.7	220.9
77.5°	121.7	120.3	121.7	122.7	123.7	126.1	129.6	134.0	141.9	152.2	169.3
80°	87.4	86.9	87.9	88.8	89.3	93.3	94.2	98.7	102.1	110.0	118.3
82.5°	57.9	58.9	59.4	60.4	59.9	61.8	62.8	65.8	68.7	72.6	79.0
85°	33.4	31.9	33.4	33.4	33.4	35.8	35.3	37.3	39.3	41.2	45.6
87.5°	11.8	11.8	12.3	12.8	12.8	14.2	13.7	14.7	16.7	16.7	18.2
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°	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6
2.5°	1250.7	1245.3	1241.4	1230.1	1223.2	1216.8	1210.9	1204.5	1197.7	1188.8	1183.4
5°	1306.2	1294.4	1277.2	1261.5	1243.8	1228.1	1215.3	1201.1	1185.4	1169.2	1155.0
7.5°	1367.5	1345.4	1318.9	1290.0	1262.5	1239.4	1215.3	1192.8	1170.7	1149.1	1129.0
10°	1428.9	1390.6	1355.7	1316.0	1279.6	1244.8	1213.4	1182.0	1154.5	1126.0	1100.5
12.5°	1485.8	1439.7	1388.6	1339.0	1290.4	1245.3	1206.5	1168.2	1132.9	1099.0	1069.1
15°	1529.5	1471.6	1411.2	1352.3	1296.3	1249.2	1198.7	1149.1	1112.3	1071.0	1038.2
17.5°	1579.6	1510.8	1451.0	1380.3	1310.6	1234.5	1181.0	1127.0	1082.8	1043.1	1010.2
20°	1612.9	1537.3	1451.0	1370.9	1299.3	1231.1	1166.8	1104.9	1058.3	1012.1	972.4
22.5°	1639.4	1561.4	1466.2	1382.7	1292.9	1210.4	1140.7	1079.9	1024.9	981.2	943.4
25°	1653.2	1558.0	1467.2	1366.0	1276.2	1197.2	1118.6	1051.4	995.9	947.3	914.9
27.5°	1653.7	1556.0	1448.5	1348.4	1252.2	1166.8	1089.2	1022.9	960.6	914.0	875.2
30°	1651.2	1543.2	1429.8	1320.4	1224.7	1137.3	1056.3	987.6	930.7	881.1	844.3
32.5°	1635.5	1525.6	1401.9	1287.0	1183.0	1095.1	1020.5	952.3	891.4	846.2	807.5
35°	1600.2	1486.8	1362.6	1244.3	1145.6	1054.3	980.7	912.0	857.5	808.4	768.7
37.5°	1555.0	1449.0	1322.8	1199.1	1092.6	1006.2	937.0	872.2	815.3	770.1	730.4
40°	1498.1	1398.4	1274.2	1145.6	1039.1	951.8	886.5	826.1	777.5	731.4	692.6
42.5°	1420.0	1343.5	1215.8	1090.7	979.2	896.8	833.5	783.4	733.3	691.6	652.8
45°	1336.6	1266.9	1153.5	1029.3	922.3	837.4	778.0	731.9	689.2	646.9	615.5
47.5°	1244.3	1187.4	1082.3	961.1	855.6	780.5	722.0	680.8	641.5	609.1	577.7
50°	1134.4	1104.4	1006.2	896.3	793.7	716.6	668.5	626.3	597.4	566.0	536.5
52.5°	1032.3	1008.2	928.2	820.2	727.0	659.2	607.7	574.3	545.8	522.8	499.2
55°	921.3	909.1	841.3	748.1	663.6	595.9	551.7	521.3	498.7	477.1	459.9
57.5°	819.2	818.2	758.4	678.4	595.9	538.5	496.3	471.2	451.6	436.4	421.6
60°	714.7	723.0	673.9	600.8	535.5	481.5	443.2	420.7	407.4	393.2	380.9
62.5°	619.9	632.7	588.0	530.6	466.3	422.1	392.7	375.5	360.8	350.5	341.1
65°	529.1	545.3	509.0	457.5	408.4	366.7	341.6	325.4	314.1	308.3	301.9
67.5°	449.1	458.0	433.4	393.2	352.4	316.1	295.5	281.3	271.4	269.0	261.6
70°	369.1	379.4	362.2	325.4	294.0	267.5	248.9	237.6	231.7	228.2	223.3
72.5°	304.8	309.2	292.1	266.5	241.5	219.4	205.7	197.3	190.5	189.0	186.5
75°	238.6	244.9	231.2	211.6	190.9	175.2	164.9	158.1	154.6	152.2	152.2
77.5°	180.1	185.5	177.7	160.5	148.2	134.5	127.6	121.2	119.8	117.3	118.3
80°	128.1	130.6	126.1	114.4	103.6	96.2	90.3	86.9	86.4	84.4	86.4
82.5°	84.9	85.4	80.5	75.1	66.8	62.8	58.9	57.4	56.9	56.9	56.0
85°	47.1	48.1	44.7	41.2	38.3	34.9	33.9	32.9	31.9	33.4	34.4
87.5°	18.2	18.7	18.2	16.7	15.7	14.7	14.2	15.2	13.7	14.7	15.2
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):

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6	1202.6
2.5°	1175.1	1171.2	1165.3	1155.5	1148.6	1141.2	1138.3	1139.3	1136.3	1132.4	1133.4
5°	1144.2	1132.9	1123.1	1109.3	1096.6	1085.8	1082.3	1077.9	1074.0	1071.5	1069.1
7.5°	1111.3	1095.6	1080.9	1067.1	1052.4	1038.6	1033.2	1029.3	1027.4	1020.5	1017.5
10°	1079.9	1061.7	1044.0	1027.8	1012.6	997.4	992.0	987.1	980.2	977.3	973.8
12.5°	1046.5	1028.3	1009.2	989.6	974.3	962.1	952.7	949.3	942.4	939.5	937.5
15°	1014.1	992.0	976.8	961.6	938.5	924.8	920.8	908.6	904.6	898.7	894.8
17.5°	981.7	961.1	938.5	920.8	906.6	889.4	880.1	874.7	867.3	861.9	854.6
20°	949.8	925.7	908.1	886.0	870.3	854.6	842.8	837.9	831.5	824.1	813.8
22.5°	918.9	892.4	875.2	854.6	834.9	816.8	807.0	800.1	787.3	785.9	776.5
25°	882.6	859.0	836.4	814.8	795.7	777.5	771.1	760.3	755.9	747.1	745.6
27.5°	848.2	823.2	798.6	775.1	758.4	745.6	734.3	727.4	723.0	716.2	716.6
30°	812.4	784.9	761.8	740.2	722.0	709.8	702.4	699.0	692.6	691.6	688.2
32.5°	774.1	749.0	725.0	705.8	687.2	676.4	673.0	669.5	665.6	666.1	665.1
35°	735.8	713.7	688.2	670.5	655.3	648.9	643.5	642.5	641.1	642.0	642.0
37.5°	698.5	674.4	653.3	637.1	628.3	619.5	617.0	616.5	617.0	618.0	620.4
40°	662.2	640.1	619.5	606.2	596.4	592.5	589.0	590.5	592.5	595.9	598.8
42.5°	625.8	604.7	587.5	574.3	565.0	563.0	563.5	566.4	566.9	571.8	577.2
45°	587.5	569.4	553.2	542.9	537.0	534.5	535.5	538.5	541.9	548.8	555.6
47.5°	552.2	536.0	521.8	511.5	507.0	506.1	508.0	512.0	519.8	526.7	534.5
50°	516.4	501.6	488.4	479.1	478.6	475.1	479.6	484.5	493.8	503.1	514.9
52.5°	481.0	466.8	455.5	448.1	446.2	446.2	451.6	460.4	468.8	481.0	491.8
55°	444.2	431.5	420.7	418.2	415.3	416.7	422.6	431.5	443.2	457.0	468.8
57.5°	406.4	395.6	387.8	384.3	382.9	387.8	394.6	404.0	419.2	432.9	445.7
60°	370.6	361.3	352.9	351.9	351.0	357.3	365.7	375.5	390.7	404.5	420.2
62.5°	332.3	324.9	319.5	318.1	318.1	324.5	333.8	346.5	360.8	375.5	392.2
65°	293.5	287.1	285.7	283.7	288.1	292.1	301.4	313.7	328.9	345.1	362.7
67.5°	257.7	253.8	250.8	250.8	254.3	261.6	270.0	282.2	297.9	315.1	330.8
70°	221.9	217.9	215.5	217.9	219.9	228.7	237.6	249.4	264.1	280.8	297.5
72.5°	184.6	185.1	185.5	185.1	187.0	195.4	204.2	215.5	229.7	245.9	261.1
75°	151.7	149.2	149.7	150.7	157.1	161.5	170.3	181.1	196.3	211.1	223.8
77.5°	117.8	116.8	119.3	119.3	125.2	130.6	137.9	148.7	162.0	175.2	185.5
80°	86.4	86.9	88.8	89.3	94.2	100.1	108.0	115.4	127.1	136.5	146.3
82.5°	58.4	59.4	61.8	65.3	67.2	70.7	77.6	85.4	93.8	103.6	109.5
85°	33.9	35.3	37.3	39.8	41.7	45.2	50.1	56.4	62.3	67.7	72.6
87.5°	16.7	16.7	18.2	19.1	20.6	22.6	26.0	28.5	32.4	36.3	38.3
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: P243511

CATALOG NUMBER: S124DR-H1020D930-X4F0-XX-UDD-A-W

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1202.6	1202.6	1202.6	1202.6
2.5°	1131.4	1130.9	1129.0	1129.9
5°	1067.6	1062.7	1062.2	1060.2
7.5°	1012.6	1011.2	1011.2	1007.2
10°	970.4	966.0	967.0	965.0
12.5°	930.2	927.7	924.8	921.8
15°	885.0	885.0	885.0	876.7
17.5°	849.7	849.2	846.7	846.2
20°	812.8	810.9	804.5	808.9
22.5°	775.5	774.1	768.7	769.7
25°	740.7	739.2	738.2	734.3
27.5°	710.8	711.2	712.2	709.8
30°	688.2	686.7	688.7	686.2
32.5°	667.1	667.1	665.1	665.6
35°	643.0	645.0	645.5	645.0
37.5°	621.9	624.4	626.3	624.4
40°	602.3	604.2	606.2	605.7
42.5°	581.7	585.1	586.6	588.0
45°	562.0	566.4	568.9	569.4
47.5°	541.9	547.3	552.2	551.7
50°	522.3	529.1	533.6	533.1
52.5°	502.6	509.5	514.9	517.4
55°	480.5	489.4	494.3	498.7
57.5°	458.5	468.3	473.2	475.1
60°	433.9	442.7	449.1	450.6
62.5°	406.4	415.8	424.1	426.1
65°	378.0	388.3	394.6	395.6
67.5°	345.1	354.9	361.3	364.2
70°	311.2	318.6	325.4	329.9
72.5°	273.4	282.2	288.6	291.6
75°	234.1	244.0	247.4	249.4
77.5°	193.4	199.3	204.7	205.2
80°	152.7	160.0	162.0	166.9
82.5°	112.4	119.3	117.8	119.8
85°	74.1	76.6	78.0	78.5
87.5°	39.3	40.7	41.7	42.2
90°	0.0	0.0	0.0	0.0

(END OF REPORT)