

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: P243521

Luminaire Tested: **S124DR-H1020D940-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P243521
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-H1020D940-X4F0-XX-UDD-A-W
Description: DEFINE 4 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER.
HIGH PERFORMANCE LIGHT ENGINE
Light Source: (184) 4000K CCT, 90 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3771.5 lumens
Efficiency: N/A
Efficacy: 119.7 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

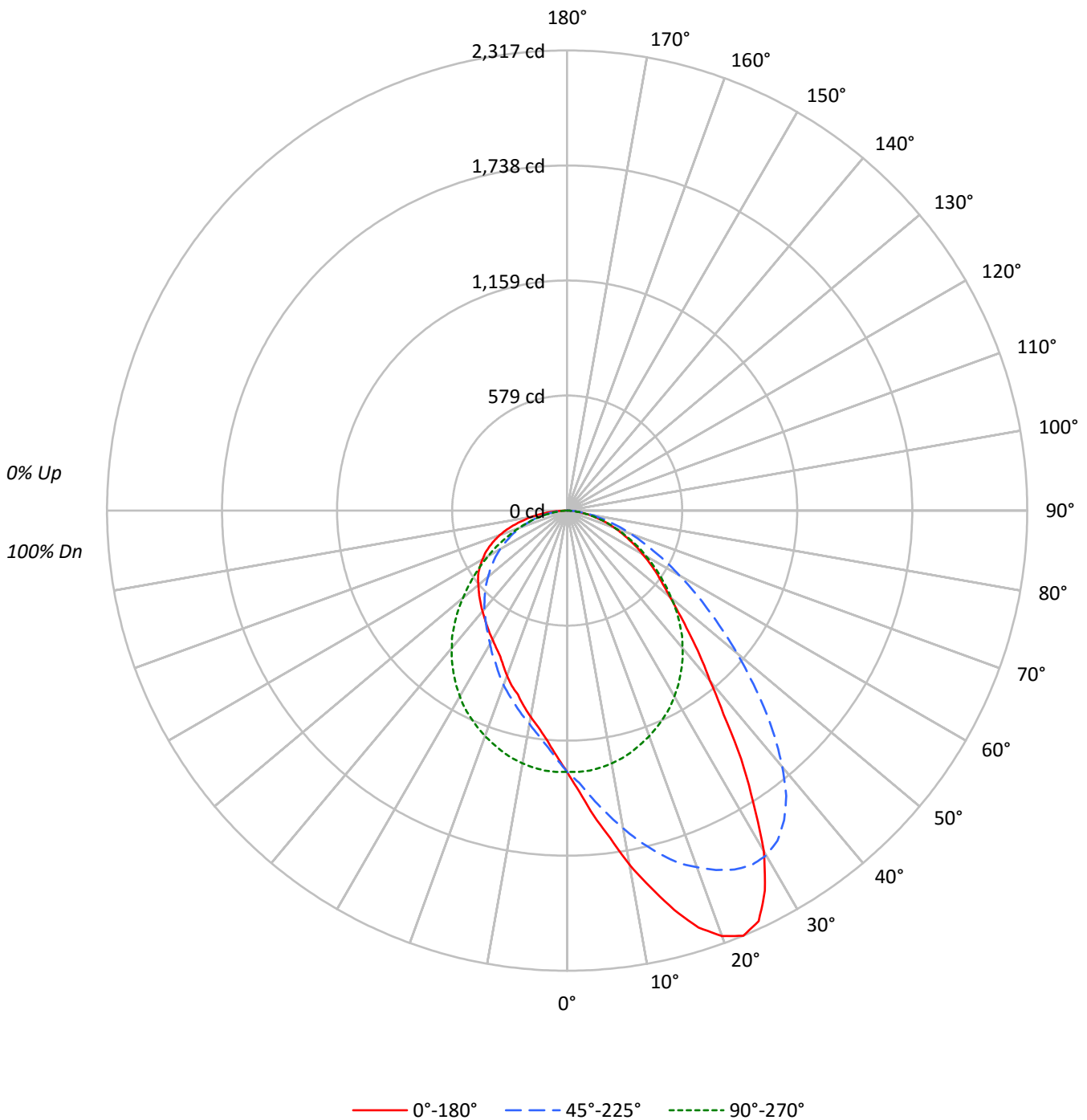
Input Watts (W): 31.5
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	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					100			
1	109	105	101	97	107	103	99	96	98	95	93	94	92	90	91	89	87	85					85			
2	100	92	86	80	97	90	84	79	87	82	77	83	79	76	80	77	74	72					72			
3	92	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61					61			
4	84	73	64	58	82	71	63	57	69	62	56	66	60	56	64	59	55	53					53			
5	78	65	56	50	75	64	56	50	62	55	49	60	54	49	58	53	48	46					46			
6	72	59	50	44	70	58	50	44	56	49	43	54	48	43	53	47	43	41					41			
7	67	53	45	39	65	53	45	39	51	44	38	50	43	38	48	42	38	36					36			
8	62	49	41	35	61	48	40	35	47	40	35	46	39	34	44	39	34	32					32			
9	58	45	37	31	57	44	37	31	43	36	31	42	36	31	41	35	31	29					29			
10	54	41	34	29	53	41	34	28	40	33	28	39	33	28	38	32	28	26					26			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	11692	11692	11692
5°	13757	11722	10347
10°	16349	11668	9527
15°	19149	11566	8823
20°	21563	11432	8369
25°	22378	11278	7877
30°	20322	11087	7703
35°	16580	10824	7655
40°	12982	10484	7687
45°	10865	10063	7829
50°	9325	9473	8062
55°	8519	8835	8452
60°	7806	8180	8761
65°	7160	7486	9101
70°	6586	6752	9377
75°	5863	5938	9366
80°	4894	4863	9342
85°	3723	3672	8761



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	128.0	3.4
10°-20°	396.5	10.5
20°-30°	637.0	16.9
30°-40°	728.2	19.3
40°-50°	670.3	17.8
50°-60°	548.3	14.5
60°-70°	390.7	10.4
70°-80°	214.7	5.7
80°-90°	57.7	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°	1161.6	30.8
0°-40°	1889.7	50.1
0°-60°	3108.3	82.4
0°-90°	3771.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3771.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1315	1315	1315	1315	1315	
5°	1542	1454	1314	1188	1160	155
15°	2081	1788	1257	1011	959	593
25°	2282	1994	1150	850	803	1024
35°	1528	1904	998	710	705	950
45°	864	1403	800	585	623	675
55°	550	862	570	456	545	493
65°	340	478	356	319	433	340
75°	171	221	173	177	273	182
85°	36	45	36	49	86	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°	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3
2.5°	1416.2	1411.9	1409.8	1407.1	1406.6	1403.9	1398.5	1391.0	1381.3	1371.1	1371.1
5°	1541.8	1540.8	1532.7	1533.3	1523.1	1511.8	1503.2	1492.5	1471.5	1453.8	1441.5
7.5°	1662.1	1673.4	1670.7	1662.1	1647.1	1631.0	1613.8	1598.8	1560.1	1538.6	1520.9
10°	1811.3	1815.6	1808.1	1795.8	1782.4	1751.2	1728.7	1703.4	1661.6	1625.1	1592.8
12.5°	1942.3	1952.5	1939.1	1927.3	1895.6	1872.5	1850.0	1799.5	1755.5	1709.3	1662.6
15°	2080.8	2070.1	2077.1	2048.1	2025.6	2003.5	1946.1	1894.6	1844.6	1787.7	1738.9
17.5°	2201.1	2201.1	2188.2	2169.4	2145.8	2104.5	2047.0	1990.1	1934.8	1860.2	1790.9
20°	2279.5	2285.4	2270.4	2250.5	2222.0	2179.1	2133.5	2071.7	1998.2	1911.2	1832.8
22.5°	2317.1	2318.1	2312.8	2296.1	2273.0	2236.5	2189.8	2129.7	2051.9	1958.4	1876.3
25°	2281.6	2287.5	2285.9	2284.9	2273.0	2252.1	2214.5	2158.7	2087.8	1994.4	1905.8
27.5°	2157.1	2171.6	2183.9	2189.3	2202.2	2203.3	2192.0	2158.2	2100.2	2012.1	1913.4
30°	1979.9	1972.4	2005.7	2022.3	2066.4	2092.7	2111.4	2109.3	2076.0	2004.6	1910.7
32.5°	1743.7	1764.1	1787.7	1826.9	1879.0	1940.2	1986.4	2020.7	2017.5	1970.8	1892.4
35°	1527.9	1527.9	1558.0	1606.3	1661.6	1735.1	1812.4	1876.3	1915.5	1903.7	1848.4
37.5°	1293.8	1308.3	1342.7	1380.3	1447.9	1518.8	1620.8	1705.6	1787.7	1812.4	1784.0
40°	1118.8	1125.2	1161.8	1193.4	1262.7	1336.2	1421.6	1530.0	1624.5	1685.2	1688.9
42.5°	988.9	988.3	1003.4	1031.8	1087.7	1153.2	1245.5	1351.8	1462.4	1548.3	1588.6
45°	864.3	863.3	878.8	907.8	947.5	1005.5	1085.5	1191.8	1305.1	1402.8	1466.2
47.5°	759.1	768.8	775.8	798.3	831.1	880.4	949.2	1034.0	1143.0	1252.5	1337.8
50°	674.3	678.6	693.6	704.4	740.9	775.2	830.5	906.7	1000.2	1115.0	1207.4
52.5°	606.6	609.3	618.5	632.4	653.4	683.4	727.4	797.8	882.1	981.9	1077.5
55°	549.7	548.1	554.0	563.2	581.4	606.6	638.9	692.5	766.1	862.2	950.2
57.5°	493.9	493.9	499.3	505.7	515.9	536.9	568.5	610.9	670.0	755.4	833.2
60°	439.1	442.9	445.1	451.5	460.1	475.7	499.3	532.6	582.5	652.3	729.6
62.5°	390.8	390.8	394.6	396.7	408.0	419.3	436.5	464.9	504.1	566.4	626.5
65°	340.4	343.6	343.6	347.9	357.5	366.1	379.6	401.0	433.2	477.8	534.2
67.5°	297.4	297.4	300.1	302.2	307.6	313.5	325.3	342.0	369.4	404.8	455.8
70°	253.4	255.0	253.9	256.6	259.8	265.7	274.3	288.3	308.2	338.8	376.3
72.5°	213.7	211.5	212.6	215.3	216.9	220.6	226.0	236.8	252.9	277.6	304.9
75°	170.7	169.6	173.4	172.3	175.0	178.2	183.1	191.1	203.5	220.6	241.6
77.5°	133.1	131.5	133.1	134.2	135.3	138.0	141.7	146.6	155.2	166.4	185.2
80°	95.6	95.0	96.1	97.2	97.7	102.0	103.1	107.9	111.7	120.3	129.4
82.5°	63.3	64.4	65.0	66.0	65.5	67.6	68.7	71.9	75.2	79.5	86.4
85°	36.5	34.9	36.5	36.5	36.5	39.2	38.7	40.8	42.9	45.1	49.9
87.5°	12.9	12.9	13.4	14.0	14.0	15.6	15.0	16.1	18.3	18.3	19.9
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°	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3
2.5°	1367.9	1362.0	1357.7	1345.4	1337.8	1330.9	1324.4	1317.4	1309.9	1300.3	1294.4
5°	1428.6	1415.7	1396.9	1379.7	1360.4	1343.2	1329.3	1313.7	1296.5	1278.8	1263.2
7.5°	1495.7	1471.5	1442.5	1410.9	1380.8	1355.6	1329.3	1304.6	1280.4	1256.8	1234.8
10°	1562.8	1520.9	1482.8	1439.3	1399.6	1361.5	1327.1	1292.7	1262.7	1231.5	1203.6
12.5°	1625.1	1574.6	1518.8	1464.5	1411.4	1362.0	1319.6	1277.7	1239.1	1202.0	1169.3
15°	1672.8	1609.5	1543.5	1479.0	1417.8	1366.3	1311.0	1256.8	1216.5	1171.4	1135.4
17.5°	1727.6	1652.4	1586.9	1509.6	1433.4	1350.2	1291.7	1232.6	1184.3	1140.8	1104.8
20°	1764.1	1681.4	1586.9	1499.4	1421.1	1346.4	1276.1	1208.5	1157.5	1107.0	1063.5
22.5°	1793.1	1707.7	1603.6	1512.3	1414.1	1323.9	1247.7	1181.1	1121.0	1073.2	1031.8
25°	1808.1	1704.0	1604.7	1494.1	1395.8	1309.4	1223.5	1149.9	1089.3	1036.1	1000.7
27.5°	1808.7	1701.8	1584.3	1474.7	1369.5	1276.1	1191.3	1118.8	1050.6	999.6	957.2
30°	1806.0	1687.9	1563.9	1444.1	1339.5	1243.9	1155.3	1080.2	1017.9	963.7	923.4
32.5°	1788.8	1668.5	1533.3	1407.6	1293.8	1197.7	1116.1	1041.5	974.9	925.5	883.1
35°	1750.1	1626.1	1490.3	1360.9	1253.0	1153.2	1072.6	997.5	937.9	884.2	840.7
37.5°	1700.8	1584.8	1446.8	1311.5	1195.0	1100.6	1024.9	954.0	891.7	842.3	798.8
40°	1638.5	1529.5	1393.7	1253.0	1136.5	1041.0	969.6	903.5	850.4	799.9	757.5
42.5°	1553.1	1469.4	1329.8	1192.9	1071.0	980.8	911.6	856.8	802.1	756.4	714.0
45°	1461.9	1385.6	1261.6	1125.8	1008.7	915.9	850.9	800.5	753.7	707.6	673.2
47.5°	1360.9	1298.7	1183.8	1051.2	935.7	853.6	789.7	744.6	701.7	666.2	631.9
50°	1240.7	1207.9	1100.6	980.3	868.1	783.8	731.2	685.0	653.4	619.0	586.8
52.5°	1129.0	1102.7	1015.2	897.1	795.1	721.0	664.6	628.1	597.0	571.8	546.0
55°	1007.7	994.3	920.2	818.2	725.8	651.7	603.4	570.1	545.4	521.8	503.0
57.5°	896.0	894.9	829.4	741.9	651.7	588.9	542.8	515.4	493.9	477.3	461.2
60°	781.7	790.8	737.1	657.1	585.7	526.7	484.8	460.1	445.6	430.0	416.6
62.5°	678.0	692.0	643.2	580.3	510.0	461.7	429.5	410.7	394.6	383.3	373.1
65°	578.7	596.4	556.7	500.3	446.7	401.0	373.7	355.9	343.6	337.1	330.2
67.5°	491.2	500.9	474.0	430.0	385.5	345.7	323.2	307.6	296.9	294.2	286.1
70°	403.7	415.0	396.2	355.9	321.6	292.6	272.2	259.8	253.4	249.6	244.3
72.5°	333.4	338.2	319.4	291.5	264.1	240.0	224.9	215.8	208.3	206.7	204.0
75°	260.9	267.9	252.9	231.4	208.8	191.7	180.4	172.9	169.1	166.4	166.4
77.5°	197.0	202.9	194.3	175.6	162.1	147.1	139.6	132.6	131.0	128.3	129.4
80°	140.1	142.8	138.0	125.1	113.3	105.2	98.8	95.0	94.5	92.3	94.5
82.5°	92.9	93.4	88.0	82.1	73.0	68.7	64.4	62.8	62.3	62.3	61.2
85°	51.5	52.6	48.9	45.1	41.9	38.1	37.0	36.0	34.9	36.5	37.6
87.5°	19.9	20.4	19.9	18.3	17.2	16.1	15.6	16.6	15.0	16.1	16.6
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°	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3	1315.3
2.5°	1285.2	1280.9	1274.5	1263.8	1256.2	1248.2	1245.0	1246.0	1242.8	1238.5	1239.6
5°	1251.4	1239.1	1228.3	1213.3	1199.3	1187.5	1183.8	1178.9	1174.6	1172.0	1169.3
7.5°	1215.4	1198.3	1182.2	1167.1	1151.0	1136.0	1130.1	1125.8	1123.6	1116.1	1112.9
10°	1181.1	1161.2	1141.9	1124.2	1107.5	1090.9	1085.0	1079.6	1072.1	1068.9	1065.1
12.5°	1144.6	1124.7	1103.8	1082.3	1065.7	1052.2	1042.0	1038.3	1030.8	1027.5	1025.4
15°	1109.1	1085.0	1068.3	1051.7	1026.5	1011.4	1007.1	993.7	989.4	983.0	978.7
17.5°	1073.7	1051.2	1026.5	1007.1	991.6	972.8	962.6	956.7	948.6	942.7	934.7
20°	1038.8	1012.5	993.2	969.0	951.8	934.7	921.8	916.4	909.4	901.4	890.1
22.5°	1005.0	976.0	957.2	934.7	913.2	893.3	882.6	875.1	861.1	859.5	849.3
25°	965.3	939.5	914.8	891.2	870.2	850.4	843.4	831.6	826.8	817.1	815.5
27.5°	927.7	900.3	873.5	847.7	829.4	815.5	803.1	795.6	790.8	783.3	783.8
30°	888.5	858.4	833.2	809.6	789.7	776.3	768.2	764.5	757.5	756.4	752.7
32.5°	846.6	819.2	792.9	772.0	751.6	739.8	736.0	732.3	728.0	728.5	727.4
35°	804.7	780.6	752.7	733.3	716.7	709.7	703.8	702.7	701.1	702.2	702.2
37.5°	763.9	737.6	714.6	696.8	687.2	677.5	674.8	674.3	674.8	675.9	678.6
40°	724.2	700.1	677.5	663.0	652.3	648.0	644.2	645.8	648.0	651.7	655.0
42.5°	684.5	661.4	642.6	628.1	617.9	615.8	616.3	619.5	620.1	625.4	631.3
45°	642.6	622.8	605.0	593.8	587.3	584.6	585.7	588.9	592.7	600.2	607.7
47.5°	604.0	586.2	570.7	559.4	554.6	553.5	555.6	559.9	568.5	576.0	584.6
50°	564.8	548.7	534.2	524.0	523.4	519.7	524.5	529.9	540.1	550.3	563.2
52.5°	526.1	510.5	498.2	490.1	488.0	488.0	493.9	503.6	512.7	526.1	537.9
55°	485.9	471.9	460.1	457.4	454.2	455.8	462.2	471.9	484.8	499.8	512.7
57.5°	444.5	432.7	424.1	420.4	418.7	424.1	431.6	441.8	458.5	473.5	487.5
60°	405.3	395.1	386.0	384.9	383.9	390.8	400.0	410.7	427.3	442.4	459.5
62.5°	363.5	355.4	349.5	347.9	347.9	354.9	365.1	379.0	394.6	410.7	428.9
65°	321.0	314.1	312.4	310.3	315.1	319.4	329.6	343.1	359.7	377.4	396.7
67.5°	281.8	277.6	274.3	274.3	278.1	286.1	295.3	308.7	325.9	344.7	361.8
70°	242.7	238.4	235.7	238.4	240.5	250.2	259.8	272.7	288.8	307.1	325.3
72.5°	201.9	202.4	202.9	202.4	204.5	213.7	223.3	235.7	251.2	269.0	285.6
75°	165.9	163.2	163.7	164.8	171.8	176.6	186.3	198.1	214.7	230.8	244.8
77.5°	128.8	127.8	130.5	130.5	136.9	142.8	150.9	162.7	177.2	191.7	202.9
80°	94.5	95.0	97.2	97.7	103.1	109.5	118.1	126.2	139.0	149.2	160.0
82.5°	63.9	65.0	67.6	71.4	73.5	77.3	84.8	93.4	102.5	113.3	119.7
85°	37.0	38.7	40.8	43.5	45.6	49.4	54.8	61.7	68.2	74.1	79.5
87.5°	18.3	18.3	19.9	20.9	22.5	24.7	28.5	31.1	35.4	39.7	41.9
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: P243521

CATALOG NUMBER: S124DR-H1020D940-X4F0-XX-UDD-A-W

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1315.3	1315.3	1315.3	1315.3
2.5°	1237.5	1236.9	1234.8	1235.8
5°	1167.7	1162.3	1161.8	1159.6
7.5°	1107.5	1105.9	1105.9	1101.6
10°	1061.4	1056.5	1057.6	1055.5
12.5°	1017.3	1014.7	1011.4	1008.2
15°	967.9	967.9	967.9	958.8
17.5°	929.3	928.8	926.1	925.5
20°	889.0	886.9	879.9	884.7
22.5°	848.2	846.6	840.7	841.8
25°	810.1	808.5	807.4	803.1
27.5°	777.4	777.9	779.0	776.3
30°	752.7	751.1	753.2	750.5
32.5°	729.6	729.6	727.4	728.0
35°	703.3	705.4	706.0	705.4
37.5°	680.2	682.9	685.0	682.9
40°	658.7	660.9	663.0	662.5
42.5°	636.2	639.9	641.5	643.2
45°	614.7	619.5	622.2	622.8
47.5°	592.7	598.6	604.0	603.4
50°	571.2	578.7	583.6	583.0
52.5°	549.7	557.3	563.2	565.8
55°	525.6	535.2	540.6	545.4
57.5°	501.4	512.2	517.5	519.7
60°	474.6	484.2	491.2	492.8
62.5°	444.5	454.7	463.8	466.0
65°	413.4	424.7	431.6	432.7
67.5°	377.4	388.1	395.1	398.3
70°	340.4	348.4	355.9	360.8
72.5°	299.0	308.7	315.7	318.9
75°	256.1	266.8	270.6	272.7
77.5°	211.5	218.0	223.9	224.4
80°	167.0	175.0	177.2	182.5
82.5°	122.9	130.5	128.8	131.0
85°	81.1	83.7	85.4	85.9
87.5°	42.9	44.6	45.6	46.2
90°	0.0	0.0	0.0	0.0

(END OF REPORT)