

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: P242130

Luminaire Tested: **S121DR-S880D840-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P242130
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1802-639-18)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: NEO-RAY
Catalog Number: S121DR-S880D840-X4F0-XX-UDD-A-W
Description: DEFINE 1 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER
STANDARD LIGHT ENGINE
Light Source: (92) 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3687.7 lumens
Efficiency: N/A
Efficacy: 106.0 lumens/watt
Spacing Criteria (0/90/45): 1.27 / 1.22 / 1.37
Luminous Opening: Rectangular (W 3.88' x L: 0.09' x H: 0')
CIE Type: Direct

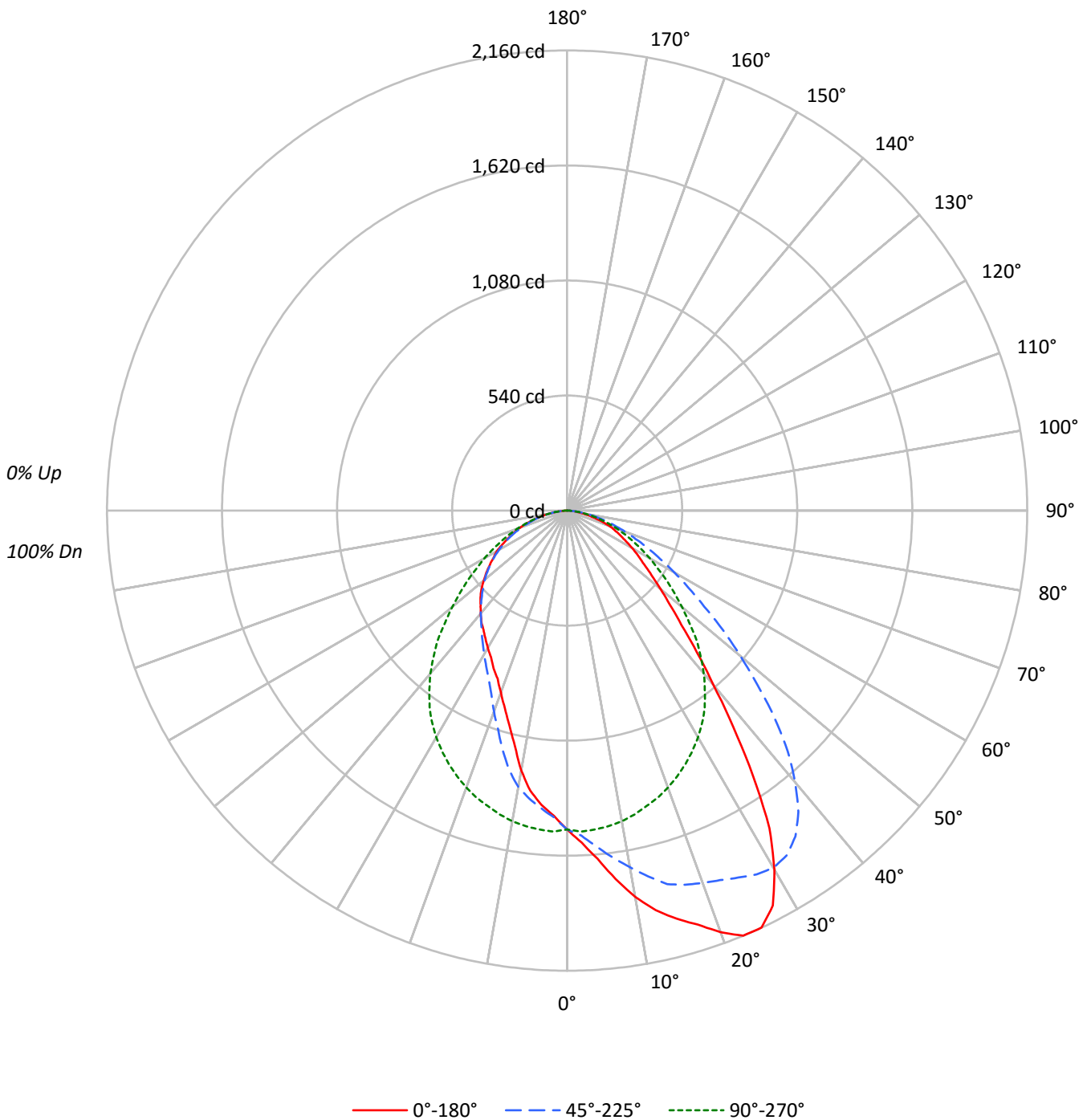
Input Watts (W): 34.8
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	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	110	105	102	98	107	103	100	96	99	96	93	95	93	91	92	90	88					86				
2	101	93	87	82	98	91	85	81	88	83	79	85	80	77	82	78	75					73				
3	92	83	75	69	90	81	74	68	78	72	67	75	70	66	73	69	65					63				
4	85	74	66	59	83	73	65	59	70	63	58	68	62	57	66	61	57					54				
5	79	66	58	52	77	65	57	51	63	56	51	61	55	50	60	54	50					48				
6	73	60	52	46	71	59	51	45	57	50	45	56	49	45	54	49	44					42				
7	68	55	46	41	66	54	46	40	52	45	40	51	45	40	50	44	40					38				
8	63	50	42	36	62	50	42	36	48	41	36	47	41	36	46	40	36					34				
9	59	46	38	33	58	46	38	33	44	38	33	43	37	33	42	37	32					31				
10	56	43	35	30	54	42	35	30	41	34	30	40	34	30	39	34	30					28				

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	44341	44341	44341
5°	48799	44701	41215
10°	55408	44540	37275
15°	60838	44049	32040
20°	66395	43614	28668
25°	70610	42926	26694
30°	66579	42035	25468
35°	55016	40714	24737
40°	41247	38605	24410
45°	31787	35994	24123
50°	26357	32382	23569
55°	22755	29404	22884
60°	20913	26519	22590
65°	19322	23971	21306
70°	18297	21537	20419
75°	15043	19015	18134
80°	11859	15493	14947
85°	9179	11389	10063



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	143.9	3.9
10°-20°	419.7	11.4
20°-30°	642.7	17.4
30°-40°	733.4	19.9
40°-50°	658.0	17.8
50°-60°	516.2	14.0
60°-70°	351.2	9.5
70°-80°	180.9	4.9
80°-90°	41.6	1.1
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°	1206.3	32.7
0°-40°	1939.7	52.6
0°-60°	3114.0	84.4
0°-90°	3687.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3687.7	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1496	1496	1496	1496	1496	
5°	1641	1583	1503	1402	1386	163
15°	1983	1815	1436	1166	1044	565
25°	2160	1901	1313	871	816	974
35°	1521	1867	1126	699	684	943
45°	759	1378	859	566	576	601
55°	440	786	569	438	443	401
65°	276	419	342	299	304	275
75°	131	184	166	153	158	142
85°	27	36	34	32	30	33
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°	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5
2.5°	1559.6	1559.6	1562.2	1561.5	1559.0	1554.5	1550.6	1546.1	1534.5	1526.8	1533.8
5°	1640.7	1644.0	1647.2	1646.5	1636.9	1628.5	1616.3	1613.1	1592.4	1582.8	1579.6
7.5°	1743.8	1743.1	1744.4	1733.5	1725.1	1716.7	1700.6	1680.7	1656.2	1642.7	1629.8
10°	1841.6	1847.4	1844.9	1831.3	1818.5	1809.5	1783.7	1759.2	1729.0	1700.0	1683.9
12.5°	1921.5	1918.3	1929.2	1916.3	1900.9	1884.1	1859.0	1837.1	1797.9	1758.6	1725.7
15°	1983.3	1980.1	1981.4	1971.7	1955.6	1940.8	1915.1	1891.9	1854.5	1815.2	1780.5
17.5°	2037.4	2040.6	2034.8	2023.2	2001.3	1984.0	1951.8	1920.2	1880.9	1841.6	1807.5
20°	2105.7	2108.9	2097.9	2081.2	2059.9	2030.3	1996.8	1951.8	1908.0	1859.7	1817.2
22.5°	2159.8	2157.8	2154.0	2137.9	2115.3	2087.6	2039.3	1989.8	1937.6	1877.7	1823.0
25°	2159.8	2162.3	2164.3	2155.9	2141.1	2117.9	2085.1	2032.9	1974.3	1900.9	1824.3
27.5°	2090.2	2101.8	2110.2	2110.2	2106.9	2106.3	2087.0	2054.1	1999.4	1925.4	1840.4
30°	1946.0	1961.4	1974.3	1994.3	2018.1	2033.5	2039.3	2026.5	1998.1	1935.7	1847.4
32.5°	1768.2	1767.0	1793.4	1825.6	1872.6	1905.4	1938.2	1957.6	1956.3	1918.9	1845.5
35°	1521.0	1539.0	1570.6	1615.6	1676.2	1730.2	1801.7	1839.1	1868.7	1867.4	1820.4
37.5°	1280.1	1282.7	1318.1	1379.9	1433.4	1517.1	1610.5	1688.4	1759.9	1783.1	1767.6
40°	1066.4	1084.4	1108.2	1159.7	1213.2	1286.6	1405.1	1509.4	1597.6	1665.9	1684.5
42.5°	901.5	911.2	934.3	979.4	1027.1	1114.6	1201.6	1313.0	1424.4	1533.2	1589.2
45°	758.6	767.6	788.8	820.4	864.8	933.7	1023.2	1131.4	1250.5	1378.0	1457.9
47.5°	654.2	657.5	673.6	697.4	739.2	789.5	861.6	966.5	1087.0	1211.2	1328.4
50°	571.8	577.0	587.9	606.6	637.5	684.5	741.8	821.0	932.4	1061.2	1180.3
52.5°	499.7	503.6	516.4	526.7	550.6	590.5	640.1	712.2	806.2	922.1	1045.1
55°	440.5	444.3	450.8	462.3	481.0	508.1	550.6	607.9	688.4	786.2	901.5
57.5°	395.4	397.3	398.6	406.3	421.1	443.0	479.1	524.2	586.6	676.1	778.5
60°	352.9	352.2	357.4	363.2	372.2	385.7	412.1	452.7	508.7	581.5	676.8
62.5°	310.4	313.6	316.8	321.3	327.1	334.8	356.1	386.4	430.8	493.3	571.8
65°	275.6	276.2	278.8	279.5	286.6	294.3	310.4	331.0	367.7	418.6	483.6
67.5°	242.1	242.8	242.1	244.1	247.3	253.7	262.1	278.8	307.2	348.4	405.0
70°	211.2	209.3	206.7	209.9	213.1	216.4	222.2	235.0	256.3	287.2	334.2
72.5°	170.0	171.3	172.6	173.9	174.5	179.0	184.2	193.2	209.9	233.7	269.8
75°	131.4	131.4	133.3	134.6	140.4	141.7	147.5	153.9	167.4	184.2	212.5
77.5°	96.6	95.9	99.2	99.8	103.0	106.9	110.1	116.6	126.9	141.0	159.7
80°	69.5	70.2	69.5	69.5	71.5	74.1	78.6	81.8	88.9	97.9	111.4
82.5°	46.4	46.4	47.0	47.0	48.9	48.9	51.5	54.1	58.6	64.4	74.1
85°	27.0	27.0	26.4	26.4	27.0	27.0	29.6	31.6	32.2	36.1	39.3
87.5°	11.6	11.6	10.9	11.6	10.9	11.6	10.9	12.2	12.9	13.5	14.8
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°	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5
2.5°	1531.9	1530.0	1529.3	1522.3	1515.2	1506.8	1505.5	1508.1	1497.1	1483.6	1483.0
5°	1571.8	1564.8	1554.5	1540.9	1529.3	1513.9	1506.2	1502.9	1486.2	1466.9	1463.0
7.5°	1616.3	1598.9	1580.2	1559.6	1539.0	1516.5	1502.3	1493.9	1470.7	1446.9	1437.3
10°	1658.8	1636.2	1607.9	1576.3	1547.4	1516.5	1495.2	1480.4	1452.1	1422.4	1407.6
12.5°	1707.7	1670.4	1630.4	1591.2	1555.7	1515.8	1483.6	1461.1	1428.2	1396.7	1374.8
15°	1743.1	1689.0	1658.1	1602.1	1557.7	1509.4	1470.1	1436.0	1399.9	1365.1	1343.2
17.5°	1770.8	1728.3	1674.2	1612.4	1552.5	1500.4	1451.4	1413.4	1365.8	1327.8	1304.0
20°	1779.8	1736.7	1681.3	1613.7	1553.8	1486.8	1428.9	1383.2	1332.3	1285.9	1253.1
22.5°	1776.6	1727.7	1671.0	1604.7	1544.2	1464.9	1404.4	1349.7	1293.0	1243.4	1198.4
25°	1769.5	1712.9	1650.4	1587.9	1520.3	1442.4	1372.9	1313.0	1244.7	1190.6	1136.5
27.5°	1765.7	1691.6	1621.4	1553.8	1489.4	1414.1	1339.4	1272.4	1197.1	1131.4	1061.8
30°	1764.4	1676.2	1587.9	1509.4	1450.1	1373.5	1299.5	1228.6	1140.4	1066.4	995.5
32.5°	1761.8	1663.3	1559.6	1465.6	1398.0	1329.1	1250.5	1180.3	1080.5	1003.2	927.3
35°	1744.4	1640.7	1526.8	1419.9	1340.7	1269.2	1199.0	1125.6	1021.9	938.9	866.1
37.5°	1707.1	1616.3	1494.6	1374.2	1279.5	1206.7	1141.7	1061.8	961.4	870.6	803.0
40°	1651.7	1577.6	1459.8	1329.1	1217.7	1137.8	1068.9	998.1	894.4	807.5	746.3
42.5°	1579.6	1522.3	1411.5	1276.3	1157.8	1068.3	998.1	927.9	832.6	748.9	694.2
45°	1484.9	1449.5	1352.3	1219.0	1099.8	996.2	920.2	859.0	770.8	694.2	643.9
47.5°	1379.9	1364.5	1283.4	1155.2	1029.6	929.2	840.3	775.9	707.0	642.0	597.6
50°	1253.1	1265.3	1201.6	1083.7	962.0	859.0	772.1	702.5	642.6	592.4	553.1
52.5°	1134.6	1163.6	1112.1	1000.0	891.2	784.3	696.7	633.0	586.0	544.8	510.6
55°	1002.6	1044.5	1013.6	917.0	808.8	714.1	626.5	569.2	528.7	497.1	468.1
57.5°	875.7	935.0	912.5	825.5	733.4	641.4	558.9	502.3	473.3	450.1	425.6
60°	763.1	817.2	813.9	739.9	647.8	566.0	498.4	447.5	421.8	406.3	385.1
62.5°	662.0	716.7	711.5	644.6	571.8	495.8	438.5	392.2	373.5	356.7	343.2
65°	558.9	605.9	608.5	558.9	488.7	427.6	378.6	341.9	325.2	314.9	305.2
67.5°	465.6	511.3	515.8	476.5	414.7	361.9	325.2	294.3	279.5	270.5	263.4
70°	383.8	421.1	429.5	396.7	344.5	303.3	272.4	248.6	238.9	229.9	227.3
72.5°	311.0	341.3	347.1	316.8	278.2	247.3	223.4	205.4	198.3	189.3	187.4
75°	247.3	268.5	269.2	249.2	220.2	196.4	177.1	166.1	158.4	152.0	150.7
77.5°	179.7	198.3	204.1	189.3	165.5	145.5	134.6	126.2	121.1	117.8	117.2
80°	130.1	142.3	144.9	132.0	117.8	105.6	97.9	90.8	87.6	84.4	83.1
82.5°	81.1	92.1	92.7	83.7	76.6	68.3	61.8	59.2	57.3	55.4	55.4
85°	43.8	49.6	48.9	45.1	41.9	37.3	34.8	33.5	32.2	30.9	30.9
87.5°	16.7	18.7	18.7	19.3	16.7	14.8	13.5	14.2	13.5	13.5	13.5
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°	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5	1496.5
2.5°	1478.5	1475.9	1469.5	1459.2	1453.4	1440.5	1441.1	1443.7	1444.3	1442.4	1441.8
5°	1452.1	1444.3	1434.0	1421.2	1412.1	1402.5	1396.0	1399.9	1398.0	1397.3	1394.1
7.5°	1423.1	1412.8	1399.9	1387.0	1376.7	1363.9	1358.7	1354.2	1349.0	1348.4	1345.8
10°	1394.1	1381.2	1366.4	1347.8	1333.6	1317.5	1302.0	1293.7	1284.0	1276.9	1262.1
12.5°	1360.0	1338.1	1321.4	1302.0	1276.3	1250.5	1233.1	1209.3	1196.4	1183.5	1166.2
15°	1320.7	1292.4	1263.4	1224.8	1202.2	1166.2	1140.4	1123.0	1103.1	1090.2	1075.4
17.5°	1264.7	1235.1	1198.4	1154.6	1114.6	1077.9	1059.3	1036.7	1028.4	1000.0	997.5
20°	1209.3	1164.9	1119.2	1074.7	1030.3	1003.9	980.1	965.3	949.8	931.8	926.0
22.5°	1146.8	1088.9	1040.6	999.4	958.8	929.8	918.2	901.5	886.7	876.4	866.7
25°	1070.9	1017.4	968.5	929.8	893.1	871.2	856.4	844.2	837.8	826.2	822.3
27.5°	1000.7	947.2	907.9	871.9	842.3	822.9	810.1	799.1	790.7	788.8	784.3
30°	929.2	883.5	846.1	815.2	788.8	778.5	766.3	761.1	756.0	753.4	748.3
32.5°	864.8	824.2	791.4	761.8	746.3	736.7	730.2	725.1	721.2	719.9	718.6
35°	806.2	768.9	741.8	720.6	709.0	698.7	695.4	690.9	689.0	688.4	687.7
37.5°	754.7	719.9	699.3	680.6	672.3	662.6	663.3	661.3	660.0	656.2	658.7
40°	702.5	675.5	654.2	639.4	633.6	630.4	629.1	627.8	628.5	628.5	627.8
42.5°	654.9	631.1	617.5	603.4	600.8	598.2	598.2	596.3	596.9	600.1	601.4
45°	611.7	593.1	580.8	569.2	569.2	566.0	568.6	567.9	569.9	571.8	573.1
47.5°	568.6	551.9	542.8	537.0	534.5	534.5	536.4	539.6	540.9	541.5	542.8
50°	525.4	513.2	505.5	502.3	501.6	504.8	506.8	506.1	508.1	510.6	512.6
52.5°	487.5	476.5	471.4	470.1	470.1	472.6	473.3	475.2	476.5	476.5	479.1
55°	448.2	440.5	436.6	435.9	436.6	437.9	440.5	441.7	441.1	442.4	442.4
57.5°	408.9	403.1	401.2	403.1	403.1	405.7	405.7	405.7	405.0	407.6	407.0
60°	372.2	365.8	367.7	367.0	369.0	369.0	370.9	370.9	369.0	371.5	372.8
62.5°	335.5	334.2	331.6	331.6	333.6	334.2	332.3	334.2	334.8	336.8	338.1
65°	296.9	292.3	294.3	293.6	295.6	298.8	296.2	296.2	298.1	300.7	302.0
67.5°	260.1	256.3	258.2	258.9	258.9	260.1	258.2	259.5	262.1	265.3	267.2
70°	222.8	221.5	222.2	221.5	221.5	224.7	225.4	224.7	227.3	230.5	231.2
72.5°	184.8	186.1	184.8	186.1	187.4	185.5	186.1	188.0	190.6	192.5	195.8
75°	150.0	148.1	148.7	152.0	151.3	152.6	152.0	153.9	158.4	157.1	157.8
77.5°	115.9	115.3	115.9	116.6	117.2	119.1	118.5	121.7	122.3	123.0	124.3
80°	82.4	83.1	83.7	85.0	86.9	86.3	87.6	88.2	90.8	88.2	90.2
82.5°	56.0	55.4	56.7	56.7	58.6	59.9	58.0	58.0	58.0	57.3	57.3
85°	30.9	32.8	32.8	32.8	31.6	31.6	32.2	31.6	31.6	31.6	30.9
87.5°	13.5	13.5	12.9	12.2	12.9	12.2	12.2	11.6	10.9	10.9	10.3
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: P242130

CATALOG NUMBER: S121DR-S880D840-X4F0-XX-UDD-A-W

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1496.5	1496.5	1496.5	1496.5
2.5°	1437.9	1441.1	1437.3	1434.7
5°	1390.9	1390.9	1387.0	1385.7
7.5°	1338.1	1338.7	1331.7	1326.5
10°	1258.9	1255.0	1244.7	1238.9
12.5°	1153.3	1159.1	1143.6	1132.0
15°	1061.2	1045.1	1051.5	1044.5
17.5°	983.9	978.8	971.7	972.3
20°	916.3	912.5	908.6	909.2
22.5°	862.9	859.7	858.4	853.9
25°	818.4	819.7	816.5	816.5
27.5°	781.7	779.8	777.9	775.3
30°	747.0	747.6	745.7	744.4
32.5°	716.1	716.7	715.4	713.5
35°	685.8	685.1	685.8	683.9
37.5°	658.1	657.5	658.1	660.7
40°	629.8	630.4	628.5	631.1
42.5°	602.1	602.7	602.7	601.4
45°	571.8	573.7	574.4	575.7
47.5°	542.2	545.4	544.1	544.8
50°	512.6	511.9	511.9	511.3
52.5°	479.7	477.8	477.2	477.8
55°	440.5	443.0	443.0	443.0
57.5°	408.3	408.9	410.8	408.3
60°	375.4	375.4	376.1	381.2
62.5°	338.7	339.4	340.6	341.3
65°	303.3	305.2	304.6	303.9
67.5°	268.5	268.5	269.2	267.9
70°	232.5	232.5	232.5	235.7
72.5°	195.1	195.1	195.8	197.0
75°	160.3	160.3	160.3	158.4
77.5°	122.3	123.0	123.0	123.6
80°	88.9	88.2	88.2	87.6
82.5°	56.0	56.7	56.0	55.4
85°	30.9	31.6	29.6	29.6
87.5°	10.9	10.9	10.3	11.6
90°	0.0	0.0	0.0	0.0

(END OF REPORT)