

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: P242989

Luminaire Tested: **S121DR-H685D840-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P242989
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1802-639-57)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: NEO-RAY
Catalog Number: S121DR-H685D840-X4F0-XX-UDD-A-W
Description: DEFINE 1 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER.
HIGH PERFORMANCE LIGHT ENGINE
Light Source: (184) 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 2714.5 lumens
Efficiency: N/A
Efficacy: 115.0 lumens/watt
Spacing Criteria (0/90/45): 1.13 / 1.2 / 1.28
Luminous Opening: Rectangular (W 3.88' x L: 0.09' x H: 0')
CIE Type: Direct

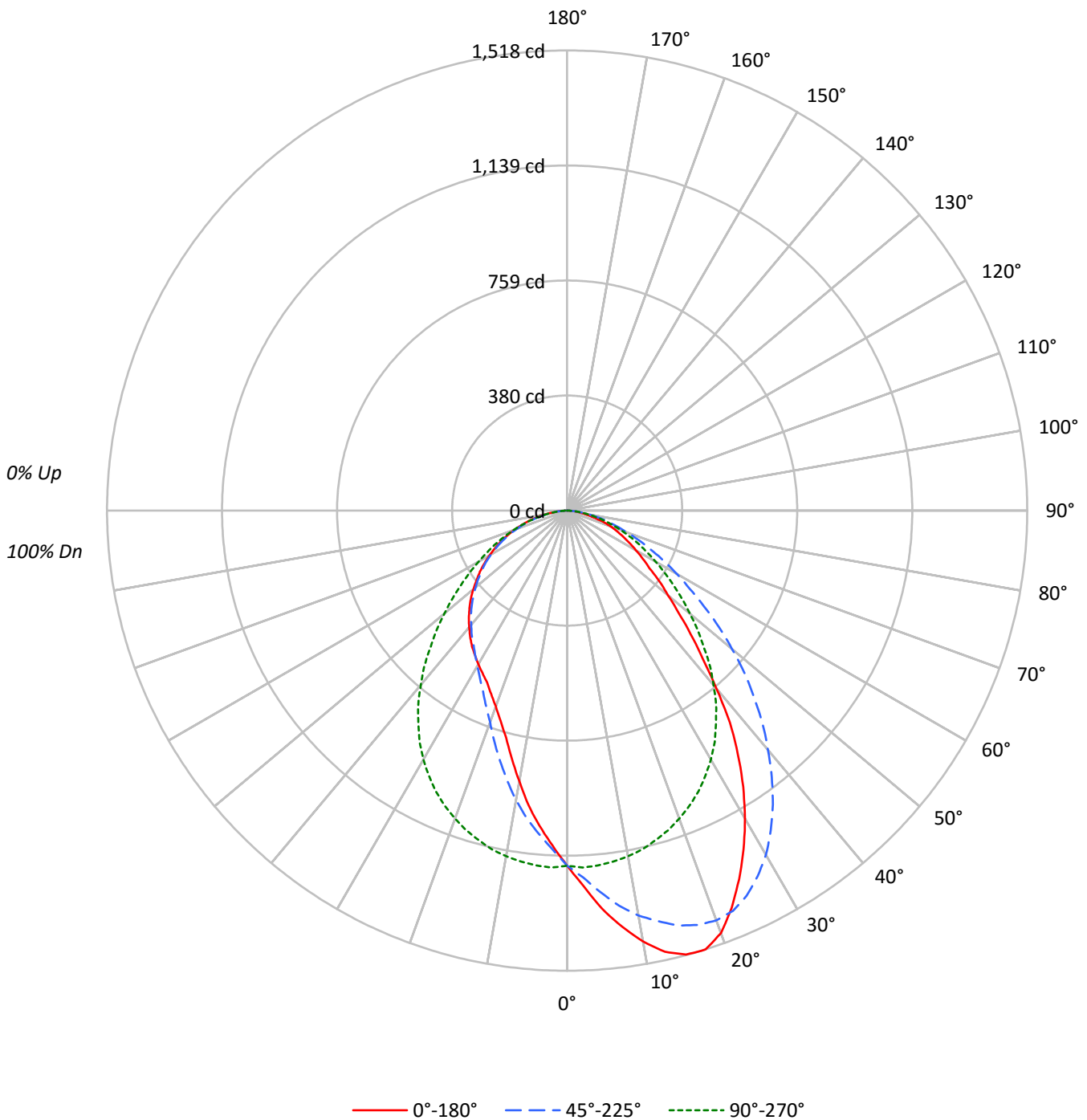
Input Watts (W): 23.6
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	81	98	91	85	80	88	83	79	84	80	77	81	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	72	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	53	45	40	51	45	40	50	44	40					38				
8	63	50	42	37	62	50	42	36	48	41	36	47	41	36	46	40	36					34				
9	59	46	38	33	58	46	38	33	45	38	33	44	37	33	43	37	33					31				
10	56	43	35	30	54	42	35	30	41	35	30	41	34	30	40	34	30					28				

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	34702	34702	34702
5°	39210	34945	31049
10°	43436	34840	27292
15°	46512	34537	23807
20°	46770	34088	21675
25°	43867	33448	20440
30°	40136	32441	20035
35°	35542	30952	19782
40°	29616	29032	19440
45°	24144	26709	19087
50°	20038	24343	18604
55°	17145	22068	18122
60°	15532	19976	17547
65°	14344	18179	16925
70°	13237	16382	15932
75°	10692	14516	14676
80°	8532	11739	12558
85°	6425	8669	10267



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	111.9	4.1
10°-20°	320.6	11.8
20°-30°	466.7	17.2
30°-40°	520.3	19.2
40°-50°	481.0	17.7
50°-60°	383.2	14.1
60°-70°	262.3	9.7
70°-80°	136.2	5.0
80°-90°	32.3	1.2
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°	899.1	33.1
0°-40°	1419.5	52.3
0°-60°	2283.7	84.1
0°-90°	2714.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2714.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1171	1171	1171	1171	1171	
5°	1318	1264	1175	1070	1044	129
15°	1516	1417	1126	855	776	425
25°	1342	1402	1023	658	625	615
35°	983	1183	856	538	547	610
45°	576	872	637	445	456	449
55°	332	551	427	342	351	304
65°	205	304	259	235	241	203
75°	93	137	127	120	128	102
85°	19	26	26	27	30	23
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°	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2
2.5°	1239.1	1239.1	1235.8	1237.2	1235.3	1232.0	1226.8	1221.1	1214.1	1211.2	1209.8
5°	1318.3	1320.2	1317.8	1313.1	1312.1	1308.4	1297.1	1290.5	1275.4	1263.6	1259.8
7.5°	1384.3	1387.6	1387.6	1379.1	1375.3	1365.9	1357.9	1347.0	1328.2	1315.0	1304.1
10°	1443.7	1445.1	1439.9	1435.2	1427.7	1420.1	1406.4	1392.8	1372.5	1356.5	1338.5
12.5°	1490.8	1493.7	1489.9	1482.3	1473.4	1463.5	1446.5	1429.1	1409.3	1387.6	1368.2
15°	1516.3	1520.5	1521.0	1514.9	1508.3	1496.5	1484.2	1465.4	1443.7	1416.8	1385.2
17.5°	1518.2	1520.1	1521.5	1516.8	1512.5	1508.3	1496.0	1480.5	1459.7	1433.3	1404.1
20°	1483.3	1487.5	1492.2	1488.0	1489.9	1489.9	1484.7	1476.7	1459.7	1438.5	1410.2
22.5°	1418.2	1428.1	1434.3	1438.5	1442.7	1448.9	1455.0	1451.2	1444.6	1429.1	1403.6
25°	1341.8	1349.9	1361.6	1365.4	1368.7	1386.6	1397.5	1405.0	1405.0	1401.7	1384.8
27.5°	1260.7	1265.9	1275.8	1289.0	1301.3	1312.1	1334.8	1348.9	1360.2	1360.2	1351.3
30°	1173.1	1180.6	1192.4	1201.3	1216.4	1238.6	1257.4	1274.4	1300.4	1311.7	1309.8
32.5°	1080.6	1088.2	1100.4	1108.0	1129.7	1147.6	1176.8	1203.2	1232.9	1249.9	1260.3
35°	982.6	983.0	1003.8	1016.0	1034.9	1057.1	1092.9	1122.6	1155.1	1183.4	1205.6
37.5°	881.7	881.2	895.8	917.5	932.6	963.7	1000.5	1033.5	1078.8	1108.9	1143.8
40°	765.7	775.6	787.9	807.7	833.6	870.4	905.3	948.2	993.4	1031.1	1068.4
42.5°	662.0	670.0	689.8	711.9	739.8	770.9	813.3	860.9	905.3	954.3	995.8
45°	576.2	580.4	592.2	610.1	639.3	674.7	719.0	769.5	821.8	871.8	918.0
47.5°	496.9	509.7	515.8	532.3	553.5	586.5	632.7	678.0	738.3	794.0	844.4
50°	434.7	437.1	447.9	460.2	485.2	509.7	544.6	591.2	647.3	710.1	761.4
52.5°	383.8	382.8	391.8	402.6	420.1	446.0	476.2	521.5	569.1	631.3	687.4
55°	331.9	336.6	340.9	351.7	367.3	387.1	412.5	450.7	495.5	550.7	609.6
57.5°	296.1	296.6	298.9	307.9	318.3	333.8	358.3	390.9	430.9	479.0	536.1
60°	262.1	262.6	266.9	269.7	276.8	290.0	308.8	335.7	371.1	417.3	467.2
62.5°	232.9	233.4	235.7	238.6	245.2	250.4	266.4	289.5	318.3	359.3	402.2
65°	204.6	205.1	205.1	208.9	213.1	217.8	229.1	243.8	271.6	304.1	342.3
67.5°	177.3	180.1	179.2	182.0	185.8	188.1	196.1	209.3	228.2	255.5	288.5
70°	152.8	152.3	153.7	155.1	156.5	160.3	165.5	174.4	190.5	209.8	239.0
72.5°	126.4	123.5	125.4	127.3	129.7	132.5	136.7	143.3	155.6	171.1	192.8
75°	93.4	91.9	94.8	95.2	99.5	103.3	108.0	114.6	123.5	136.7	150.9
77.5°	67.9	69.8	70.7	71.7	72.1	76.4	81.6	87.2	92.4	104.7	115.5
80°	50.0	50.0	50.4	51.4	52.3	53.3	56.6	60.4	64.6	72.1	83.0
82.5°	34.9	34.4	34.4	34.9	35.4	36.3	37.7	39.1	42.9	46.7	52.3
85°	18.9	19.3	19.8	18.9	19.3	19.8	20.7	22.2	23.1	25.9	28.3
87.5°	6.6	8.0	7.5	7.5	8.0	8.0	8.0	9.0	9.0	9.0	10.4
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):

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2
2.5°	1208.4	1207.0	1203.2	1195.7	1190.5	1181.1	1179.2	1178.7	1170.2	1157.5	1156.6
5°	1253.2	1242.4	1233.4	1220.2	1207.0	1191.0	1181.5	1174.9	1159.9	1141.0	1132.5
7.5°	1294.2	1278.7	1260.3	1239.5	1220.2	1197.6	1181.1	1167.9	1145.7	1121.7	1107.0
10°	1327.2	1307.9	1284.8	1257.0	1230.6	1200.9	1177.8	1158.0	1128.7	1099.0	1079.2
12.5°	1349.9	1328.2	1301.8	1269.2	1237.2	1203.2	1169.8	1144.8	1108.0	1073.6	1048.1
15°	1375.3	1339.5	1312.1	1275.4	1237.6	1197.1	1161.7	1125.9	1083.5	1044.8	1011.8
17.5°	1381.5	1348.4	1315.9	1275.4	1236.2	1186.7	1145.7	1106.1	1059.0	1011.3	979.3
20°	1387.1	1349.4	1309.3	1265.5	1224.4	1173.5	1127.3	1081.1	1026.4	975.0	935.0
22.5°	1382.9	1346.1	1301.3	1251.8	1207.5	1155.1	1105.2	1054.2	992.9	939.2	893.9
25°	1370.6	1336.7	1290.5	1236.2	1183.0	1129.7	1077.3	1023.1	956.6	894.4	844.4
27.5°	1345.6	1315.4	1271.1	1213.6	1157.5	1098.6	1043.9	987.3	916.1	852.4	799.2
30°	1312.1	1288.1	1243.3	1185.8	1125.0	1061.8	1005.7	948.2	874.1	804.8	748.2
32.5°	1265.9	1249.0	1210.3	1154.2	1088.7	1021.7	964.2	905.7	826.5	760.5	703.0
35°	1214.1	1206.1	1171.6	1115.5	1047.6	977.4	915.6	855.7	782.7	712.9	657.7
37.5°	1153.3	1158.9	1127.8	1072.2	1001.9	930.2	865.2	807.2	733.2	666.2	612.0
40°	1092.9	1101.4	1077.8	1026.0	952.9	878.8	812.8	750.6	681.8	622.8	569.1
42.5°	1026.0	1042.9	1024.5	974.1	902.9	824.6	755.8	697.8	632.3	578.0	530.9
45°	954.8	976.4	968.9	917.5	847.3	770.4	697.8	637.4	584.6	536.5	493.6
47.5°	882.6	907.6	904.3	861.4	794.0	715.2	643.6	584.2	535.6	496.9	461.1
50°	808.6	834.1	834.5	796.3	733.6	658.7	581.8	528.1	489.4	455.5	426.2
52.5°	736.5	761.9	762.4	732.7	670.0	596.9	526.2	477.1	444.1	417.7	393.2
55°	661.0	690.7	693.6	664.8	609.2	538.9	473.8	427.2	397.9	381.0	359.7
57.5°	584.6	616.7	622.4	599.3	545.5	480.0	425.3	380.5	356.9	345.1	329.1
60°	513.4	545.0	554.0	527.6	483.3	427.2	374.8	337.1	318.3	308.8	297.5
62.5°	447.9	479.5	484.2	461.6	417.7	370.6	331.0	296.6	281.0	273.9	265.0
65°	383.8	412.1	418.2	397.9	358.3	319.2	284.3	259.3	245.6	239.5	233.9
67.5°	324.9	351.3	355.5	337.1	304.1	270.6	245.2	223.5	214.1	206.0	203.7
70°	269.2	293.3	297.0	278.6	252.7	225.4	204.2	189.1	180.1	175.4	172.1
72.5°	217.8	236.7	240.0	228.7	208.4	184.4	167.8	155.1	149.5	145.2	143.8
75°	170.2	188.6	189.1	179.2	162.7	146.2	133.4	126.8	120.2	116.0	115.0
77.5°	130.6	141.0	142.4	137.2	121.2	110.8	100.9	96.2	93.8	89.6	89.6
80°	93.4	99.5	101.8	94.3	86.8	77.8	72.6	68.8	67.0	64.1	64.1
82.5°	58.0	63.2	66.0	60.4	56.6	51.9	48.1	45.7	44.3	42.9	42.4
85°	31.6	35.4	35.4	33.5	30.2	27.8	26.4	25.5	25.0	24.5	24.0
87.5°	11.3	14.1	12.7	13.2	11.8	11.3	10.8	10.8	11.3	10.4	10.4
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°	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2	1171.2
2.5°	1150.4	1148.1	1141.0	1134.4	1129.2	1117.9	1115.5	1116.5	1116.5	1116.9	1111.8
5°	1122.6	1112.7	1101.4	1091.0	1083.0	1070.3	1063.2	1061.3	1059.9	1057.1	1051.9
7.5°	1091.0	1079.7	1063.7	1054.2	1037.3	1023.1	1013.2	1006.6	1002.4	996.2	987.8
10°	1059.0	1042.5	1024.5	1005.7	988.7	969.8	954.3	946.7	937.8	931.7	922.2
12.5°	1026.9	1003.8	979.3	957.6	934.5	912.3	896.3	885.9	869.9	860.9	851.0
15°	984.9	956.6	935.9	898.2	886.9	854.8	835.5	827.5	811.9	809.1	793.5
17.5°	945.3	912.8	882.1	850.6	820.4	798.2	781.7	771.3	759.1	751.5	741.2
20°	895.8	861.9	825.1	792.1	766.6	743.1	732.7	719.5	712.4	704.9	697.3
22.5°	848.7	807.2	770.4	743.5	717.6	698.3	687.0	678.0	671.9	664.3	659.1
25°	798.2	759.6	725.6	697.8	672.8	657.7	648.3	643.1	639.3	633.7	630.4
27.5°	750.1	711.0	677.5	656.3	636.0	622.8	618.1	613.4	608.7	606.8	606.3
30°	698.7	662.9	635.6	617.2	598.8	591.7	589.4	584.6	585.6	586.1	584.6
32.5°	655.4	620.5	599.7	584.2	570.0	564.8	564.4	562.5	563.0	565.3	564.4
35°	610.6	584.6	563.9	551.2	542.2	538.4	538.9	539.4	542.2	542.7	544.6
37.5°	572.4	547.4	533.7	521.5	517.2	517.2	517.7	518.2	520.5	523.3	524.3
40°	534.7	514.4	502.6	494.6	492.2	492.2	494.1	496.5	497.9	500.7	501.2
42.5°	500.7	483.7	474.8	466.8	467.7	470.1	470.5	472.0	475.7	476.2	477.1
45°	467.2	454.5	445.6	443.2	443.2	445.1	447.4	448.4	451.2	451.7	452.6
47.5°	438.5	425.3	418.7	416.3	417.7	420.1	423.4	424.8	427.2	426.7	429.1
50°	406.4	395.6	390.4	389.4	390.4	394.6	396.0	399.3	401.7	403.1	404.1
52.5°	375.8	367.3	364.9	364.5	366.3	369.2	371.1	374.4	377.2	377.2	376.7
55°	346.5	339.0	336.2	338.5	340.9	342.3	346.1	348.0	350.8	351.3	350.8
57.5°	316.8	310.2	309.3	310.2	315.0	317.8	320.1	320.1	321.6	322.0	323.4
60°	286.2	281.9	281.0	283.4	288.5	290.4	291.8	292.3	294.2	293.3	296.1
62.5°	257.4	253.2	255.1	257.4	259.3	262.1	263.1	265.4	265.0	265.9	267.3
65°	227.7	225.4	225.8	228.7	231.0	234.8	234.8	234.8	237.2	237.2	238.1
67.5°	199.0	197.6	199.4	201.8	202.3	204.6	204.2	207.0	208.9	209.8	210.8
70°	171.1	170.2	170.2	172.6	174.9	175.9	176.8	178.7	179.2	180.6	182.9
72.5°	144.7	141.9	142.4	145.7	145.7	147.6	149.9	149.9	152.8	153.2	155.6
75°	116.0	115.0	116.0	117.9	120.2	119.8	122.6	122.1	123.1	126.4	126.8
77.5°	90.5	89.1	91.5	92.4	92.9	93.4	94.3	96.7	98.5	100.0	100.4
80°	65.1	64.6	67.0	67.9	67.4	68.4	69.8	72.1	72.1	73.1	74.5
82.5°	43.8	42.9	44.3	45.7	46.7	47.1	47.1	48.1	48.6	49.5	49.5
85°	25.0	25.0	25.9	26.4	27.3	26.9	27.8	27.3	28.3	29.2	28.8
87.5°	10.8	10.8	10.8	10.8	11.3	11.3	11.8	11.8	11.3	11.8	10.8
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: P242989

CATALOG NUMBER: S121DR-H685D840-X4F0-XX-UDD-A-W

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1171.2	1171.2	1171.2	1171.2
2.5°	1109.9	1110.8	1108.5	1106.1
5°	1051.4	1048.1	1044.8	1043.9
7.5°	985.9	985.9	977.9	979.7
10°	915.6	912.8	906.7	907.1
12.5°	847.3	844.9	841.6	840.2
15°	785.5	786.9	789.3	776.1
17.5°	736.9	733.2	731.3	728.9
20°	693.6	691.7	687.9	687.4
22.5°	660.1	655.8	654.9	655.4
25°	628.0	628.0	628.0	625.2
27.5°	605.4	605.4	604.0	604.4
30°	585.6	586.5	585.1	585.6
32.5°	566.7	567.2	566.3	565.8
35°	545.5	546.9	546.5	546.9
37.5°	525.2	526.2	525.2	525.2
40°	502.1	504.5	504.0	502.6
42.5°	479.0	479.0	480.4	480.0
45°	455.0	454.0	454.0	455.5
47.5°	429.5	431.4	430.5	430.9
50°	405.9	405.5	404.1	403.6
52.5°	378.1	379.1	378.6	376.2
55°	351.3	351.3	350.8	350.8
57.5°	322.5	323.9	323.4	323.4
60°	295.1	296.1	296.6	296.1
62.5°	267.3	267.8	267.3	267.8
65°	240.5	240.5	240.0	241.4
67.5°	211.2	211.7	211.2	212.2
70°	183.4	184.4	184.8	183.9
72.5°	157.0	156.1	156.5	155.6
75°	127.8	128.2	127.8	128.2
77.5°	100.4	100.9	100.4	100.9
80°	74.0	74.0	74.5	73.6
82.5°	50.0	50.0	51.4	50.0
85°	29.2	29.2	28.3	30.2
87.5°	11.3	11.3	11.3	11.3
90°	0.0	0.0	0.0	0.0

(END OF REPORT)