

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: P242128

Luminaire Tested: **S121DR-S490D840-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P242128  
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-S490D840-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: 2076.3 lumens  
Efficiency: N/A  
Efficacy: 110.4 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

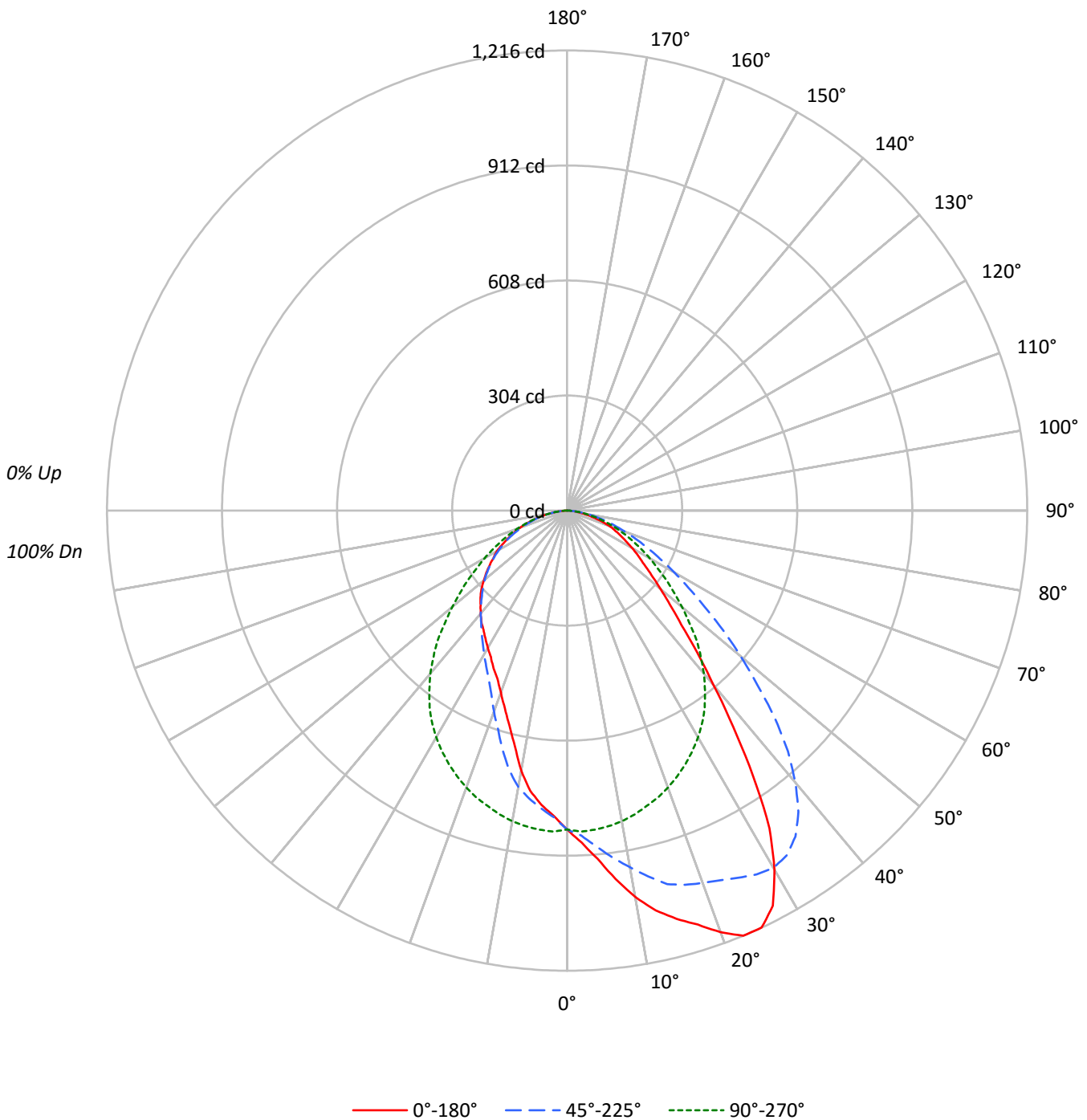
Input Watts (W): 18.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	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°	24966	24966	24966
5°	27476	25168	23205
10°	31197	25077	20989
15°	34255	24801	18040
20°	37383	24557	16141
25°	39754	24170	15029
30°	37488	23669	14339
35°	30977	22925	13926
40°	23223	21738	13743
45°	17897	20268	13581
50°	14843	18235	13271
55°	12811	16556	12883
60°	11775	14933	12717
65°	10881	13496	11996
70°	10300	12128	11496
75°	8472	10704	10212
80°	6689	8719	8412
85°	5167	6425	5677



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	81.0	3.9
10°-20°	236.3	11.4
20°-30°	361.9	17.4
30°-40°	412.9	19.9
40°-50°	370.5	17.8
50°-60°	290.7	14.0
60°-70°	197.7	9.5
70°-80°	101.8	4.9
80°-90°	23.4	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°	679.2	32.7
0°-40°	1092.2	52.6
0°-60°	1753.3	84.4
0°-90°	2076.3	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2076.3	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	843	843	843	843	843	
5°	924	891	846	790	780	92
15°	1117	1022	808	657	588	318
25°	1216	1070	739	491	460	548
35°	856	1051	634	393	385	531
45°	427	776	484	319	324	339
55°	248	443	320	246	249	226
65°	155	236	192	168	171	155
75°	74	104	94	86	89	80
85°	15	20	19	18	17	18
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°	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6
2.5°	878.1	878.1	879.6	879.2	877.8	875.2	873.1	870.5	864.0	859.6	863.6
5°	923.8	925.6	927.4	927.1	921.6	916.9	910.0	908.2	896.6	891.2	889.4
7.5°	981.8	981.5	982.2	976.0	971.3	966.6	957.5	946.3	932.5	924.9	917.7
10°	1036.9	1040.2	1038.8	1031.1	1023.9	1018.8	1004.3	990.5	973.5	957.2	948.1
12.5°	1081.9	1080.1	1086.2	1079.0	1070.3	1060.9	1046.7	1034.4	1012.3	990.2	971.7
15°	1116.7	1114.9	1115.6	1110.2	1101.1	1092.8	1078.3	1065.2	1044.2	1022.1	1002.5
17.5°	1147.2	1149.0	1145.7	1139.2	1126.9	1117.1	1098.9	1081.2	1059.1	1036.9	1017.7
20°	1185.6	1187.4	1181.2	1171.8	1159.8	1143.2	1124.3	1098.9	1074.3	1047.1	1023.2
22.5°	1216.0	1215.0	1212.8	1203.7	1191.0	1175.4	1148.2	1120.3	1091.0	1057.2	1026.4
25°	1216.0	1217.5	1218.6	1213.9	1205.5	1192.5	1174.0	1144.6	1111.6	1070.3	1027.1
27.5°	1176.9	1183.4	1188.1	1188.1	1186.3	1186.0	1175.1	1156.6	1125.8	1084.1	1036.2
30°	1095.7	1104.4	1111.6	1122.9	1136.3	1145.0	1148.2	1141.0	1125.0	1089.9	1040.2
32.5°	995.6	994.9	1009.7	1027.9	1054.3	1072.8	1091.3	1102.2	1101.5	1080.4	1039.1
35°	856.4	866.5	884.3	909.7	943.8	974.2	1014.5	1035.5	1052.2	1051.4	1025.0
37.5°	720.8	722.2	742.2	777.0	807.1	854.2	906.8	950.6	990.9	1003.9	995.2
40°	600.4	610.6	624.0	653.0	683.1	724.4	791.1	849.9	899.5	938.0	948.5
42.5°	507.6	513.0	526.1	551.5	578.3	627.6	676.5	739.3	802.0	863.3	894.8
45°	427.1	432.2	444.1	461.9	486.9	525.7	576.1	637.0	704.1	775.9	820.8
47.5°	368.4	370.2	379.2	392.7	416.2	444.5	485.1	544.2	612.0	682.0	748.0
50°	322.0	324.9	331.0	341.5	358.9	385.4	417.7	462.3	525.0	597.5	664.6
52.5°	281.4	283.5	290.8	296.6	310.0	332.5	360.4	401.0	453.9	519.2	588.4
55°	248.0	250.2	253.8	260.3	270.8	286.1	310.0	342.3	387.6	442.7	507.6
57.5°	222.6	223.7	224.4	228.8	237.1	249.4	269.7	295.1	330.3	380.7	438.3
60°	198.7	198.3	201.2	204.5	209.6	217.2	232.0	254.9	286.4	327.4	381.1
62.5°	174.8	176.6	178.4	180.9	184.2	188.5	200.5	217.5	242.6	277.7	322.0
65°	155.2	155.5	157.0	157.4	161.3	165.7	174.8	186.4	207.0	235.7	272.3
67.5°	136.3	136.7	136.3	137.4	139.2	142.9	147.6	157.0	172.9	196.1	228.1
70°	118.9	117.8	116.4	118.2	120.0	121.8	125.1	132.3	144.3	161.7	188.2
72.5°	95.7	96.4	97.2	97.9	98.3	100.8	103.7	108.8	118.2	131.6	151.9
75°	74.0	74.0	75.1	75.8	79.0	79.8	83.0	86.7	94.3	103.7	119.6
77.5°	54.4	54.0	55.8	56.2	58.0	60.2	62.0	65.6	71.4	79.4	89.9
80°	39.2	39.5	39.2	39.2	40.2	41.7	44.2	46.0	50.0	55.1	62.7
82.5°	26.1	26.1	26.5	26.5	27.6	27.6	29.0	30.5	33.0	36.3	41.7
85°	15.2	15.2	14.9	14.9	15.2	15.2	16.7	17.8	18.1	20.3	22.1
87.5°	6.5	6.5	6.2	6.5	6.2	6.5	6.2	6.9	7.3	7.6	8.3
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°	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6
2.5°	862.5	861.5	861.1	857.1	853.1	848.4	847.7	849.1	843.0	835.4	835.0
5°	885.0	881.0	875.2	867.6	861.1	852.4	848.0	846.2	836.8	825.9	823.7
7.5°	910.0	900.3	889.7	878.1	866.5	853.8	845.9	841.2	828.1	814.7	809.2
10°	934.0	921.3	905.3	887.6	871.2	853.8	841.9	833.5	817.6	800.9	792.6
12.5°	961.5	940.5	918.0	895.9	876.0	853.5	835.4	822.7	804.2	786.4	774.1
15°	981.5	951.0	933.6	902.1	877.0	849.9	827.7	808.5	788.2	768.6	756.3
17.5°	997.1	973.1	942.7	907.9	874.1	844.8	817.2	795.8	769.0	747.6	734.2
20°	1002.1	977.8	946.7	908.6	874.9	837.2	804.5	778.8	750.1	724.0	705.6
22.5°	1000.3	972.8	940.9	903.5	869.4	824.8	790.8	759.9	728.0	700.1	674.7
25°	996.3	964.4	929.3	894.1	856.0	812.1	773.0	739.3	700.8	670.4	639.9
27.5°	994.2	952.5	912.9	874.9	838.6	796.2	754.1	716.4	674.0	637.0	597.9
30°	993.4	943.8	894.1	849.9	816.5	773.4	731.7	691.8	642.1	600.4	560.5
32.5°	992.0	936.5	878.1	825.2	787.1	748.3	704.1	664.6	608.4	564.9	522.1
35°	982.2	923.8	859.6	799.5	754.9	714.6	675.1	633.8	575.4	528.6	487.7
37.5°	961.2	910.0	841.5	773.7	720.4	679.4	642.8	597.9	541.3	490.2	452.1
40°	930.0	888.3	821.9	748.3	685.6	640.7	601.9	562.0	503.6	454.7	420.2
42.5°	889.4	857.1	794.7	718.6	651.9	601.5	562.0	522.5	468.8	421.7	390.8
45°	836.1	816.1	761.4	686.3	619.3	560.9	518.1	483.7	434.0	390.8	362.6
47.5°	777.0	768.3	722.6	650.4	579.7	523.2	473.1	436.9	398.1	361.5	336.5
50°	705.6	712.4	676.5	610.2	541.7	483.7	434.7	395.6	361.8	333.6	311.4
52.5°	638.8	655.2	626.2	563.1	501.8	441.6	392.3	356.4	329.9	306.7	287.5
55°	564.5	588.1	570.7	516.3	455.4	402.1	352.8	320.5	297.7	279.9	263.6
57.5°	493.1	526.4	513.8	464.8	413.0	361.1	314.7	282.8	266.5	253.4	239.7
60°	429.6	460.1	458.3	416.6	364.7	318.7	280.6	252.0	237.5	228.8	216.8
62.5°	372.7	403.5	400.6	362.9	322.0	279.2	246.9	220.8	210.3	200.9	193.2
65°	314.7	341.2	342.6	314.7	275.2	240.7	213.2	192.5	183.1	177.3	171.9
67.5°	262.1	287.9	290.4	268.3	233.5	203.8	183.1	165.7	157.4	152.3	148.3
70°	216.1	237.1	241.8	223.3	194.0	170.8	153.4	140.0	134.5	129.4	128.0
72.5°	175.1	192.2	195.4	178.4	156.6	139.2	125.8	115.7	111.7	106.6	105.5
75°	139.2	151.2	151.6	140.3	124.0	110.6	99.7	93.5	89.2	85.6	84.8
77.5°	101.2	111.7	114.9	106.6	93.2	81.9	75.8	71.1	68.2	66.3	66.0
80°	73.2	80.1	81.6	74.3	66.3	59.5	55.1	51.1	49.3	47.5	46.8
82.5°	45.7	51.8	52.2	47.1	43.1	38.4	34.8	33.4	32.3	31.2	31.2
85°	24.7	27.9	27.6	25.4	23.6	21.0	19.6	18.9	18.1	17.4	17.4
87.5°	9.4	10.5	10.5	10.9	9.4	8.3	7.6	8.0	7.6	7.6	7.6
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°	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6	842.6
2.5°	832.5	831.0	827.4	821.6	818.3	811.1	811.4	812.9	813.2	812.1	811.8
5°	817.6	813.2	807.4	800.2	795.1	789.7	786.0	788.2	787.1	786.8	785.0
7.5°	801.3	795.5	788.2	781.0	775.2	767.9	765.0	762.5	759.6	759.2	757.8
10°	785.0	777.7	769.4	758.9	750.9	741.8	733.1	728.4	723.0	719.0	710.6
12.5°	765.7	753.4	744.0	733.1	718.6	704.1	694.3	680.9	673.6	666.4	656.6
15°	743.6	727.7	711.4	689.6	676.9	656.6	642.1	632.3	621.1	613.8	605.5
17.5°	712.1	695.4	674.7	650.1	627.6	606.9	596.4	583.7	579.0	563.1	561.6
20°	680.9	655.9	630.1	605.1	580.1	565.2	551.8	543.5	534.8	524.6	521.4
22.5°	645.7	613.1	585.9	562.7	539.9	523.5	517.0	507.6	499.3	493.5	488.0
25°	602.9	572.9	545.3	523.5	502.9	490.6	482.2	475.3	471.7	465.2	463.0
27.5°	563.4	533.3	511.2	490.9	474.2	463.4	456.1	449.9	445.2	444.1	441.6
30°	523.2	497.4	476.4	459.0	444.1	438.3	431.5	428.6	425.7	424.2	421.3
32.5°	486.9	464.1	445.6	428.9	420.2	414.8	411.1	408.2	406.1	405.3	404.6
35°	453.9	432.9	417.7	405.7	399.2	393.4	391.6	389.0	387.9	387.6	387.2
37.5°	424.9	405.3	393.7	383.2	378.5	373.1	373.4	372.4	371.6	369.5	370.9
40°	395.6	380.3	368.4	360.0	356.8	355.0	354.2	353.5	353.9	353.9	353.5
42.5°	368.7	355.3	347.7	339.7	338.3	336.8	336.8	335.7	336.1	337.9	338.6
45°	344.4	333.9	327.0	320.5	320.5	318.7	320.1	319.8	320.9	322.0	322.7
47.5°	320.1	310.7	305.6	302.4	300.9	300.9	302.0	303.8	304.6	304.9	305.6
50°	295.9	289.0	284.6	282.8	282.4	284.3	285.3	285.0	286.1	287.5	288.6
52.5°	274.5	268.3	265.4	264.7	264.7	266.1	266.5	267.6	268.3	268.3	269.7
55°	252.3	248.0	245.8	245.5	245.8	246.5	248.0	248.7	248.4	249.1	249.1
57.5°	230.2	227.0	225.9	227.0	227.0	228.4	228.4	228.4	228.1	229.5	229.1
60°	209.6	205.9	207.0	206.7	207.8	207.8	208.8	208.8	207.8	209.2	209.9
62.5°	188.9	188.2	186.7	186.7	187.8	188.2	187.1	188.2	188.5	189.6	190.3
65°	167.1	164.6	165.7	165.3	166.4	168.2	166.8	166.8	167.9	169.3	170.0
67.5°	146.5	144.3	145.4	145.8	145.8	146.5	145.4	146.1	147.6	149.4	150.5
70°	125.4	124.7	125.1	124.7	124.7	126.5	126.9	126.5	128.0	129.8	130.2
72.5°	104.1	104.8	104.1	104.8	105.5	104.4	104.8	105.9	107.3	108.4	110.2
75°	84.5	83.4	83.8	85.6	85.2	85.9	85.6	86.7	89.2	88.5	88.8
77.5°	65.3	64.9	65.3	65.6	66.0	67.1	66.7	68.5	68.9	69.3	70.0
80°	46.4	46.8	47.1	47.9	48.9	48.6	49.3	49.7	51.1	49.7	50.8
82.5°	31.5	31.2	31.9	31.9	33.0	33.7	32.6	32.6	32.6	32.3	32.3
85°	17.4	18.5	18.5	18.5	17.8	17.8	18.1	17.8	17.8	17.8	17.4
87.5°	7.6	7.6	7.3	6.9	7.3	6.9	6.9	6.5	6.2	6.2	5.8
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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CATALOG NUMBER: S121DR-S490D840-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	842.6	842.6	842.6	842.6
2.5°	809.6	811.4	809.2	807.8
5°	783.1	783.1	781.0	780.2
7.5°	753.4	753.8	749.8	746.9
10°	708.8	706.6	700.8	697.6
12.5°	649.4	652.6	643.9	637.4
15°	597.5	588.4	592.1	588.1
17.5°	554.0	551.1	547.1	547.5
20°	515.9	513.8	511.6	511.9
22.5°	485.8	484.0	483.3	480.8
25°	460.8	461.5	459.7	459.7
27.5°	440.2	439.1	438.0	436.5
30°	420.6	420.9	419.9	419.1
32.5°	403.2	403.5	402.8	401.7
35°	386.1	385.8	386.1	385.0
37.5°	370.5	370.2	370.5	372.0
40°	354.6	355.0	353.9	355.3
42.5°	339.0	339.4	339.4	338.6
45°	322.0	323.0	323.4	324.1
47.5°	305.3	307.1	306.4	306.7
50°	288.6	288.2	288.2	287.9
52.5°	270.1	269.0	268.7	269.0
55°	248.0	249.4	249.4	249.4
57.5°	229.9	230.2	231.3	229.9
60°	211.4	211.4	211.7	214.6
62.5°	190.7	191.1	191.8	192.2
65°	170.8	171.9	171.5	171.1
67.5°	151.2	151.2	151.6	150.8
70°	130.9	130.9	130.9	132.7
72.5°	109.9	109.9	110.2	110.9
75°	90.3	90.3	90.3	89.2
77.5°	68.9	69.3	69.3	69.6
80°	50.0	49.7	49.7	49.3
82.5°	31.5	31.9	31.5	31.2
85°	17.4	17.8	16.7	16.7
87.5°	6.2	6.2	5.8	6.5
90°	0.0	0.0	0.0	0.0

(END OF REPORT)