

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: P242143

Luminaire Tested: **S121DR-S490D940-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P242143  
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-S490D940-X4F0-XX-UDD-A-W  
Description: DEFINE 1 DIRECT RECESSED WITH ASYMMETRIC FLUSH DIFFUSER  
STANDARD LIGHT ENGINE  
Light Source: (92) 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1833.4 lumens  
Efficiency: N/A  
Efficacy: 97.5 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

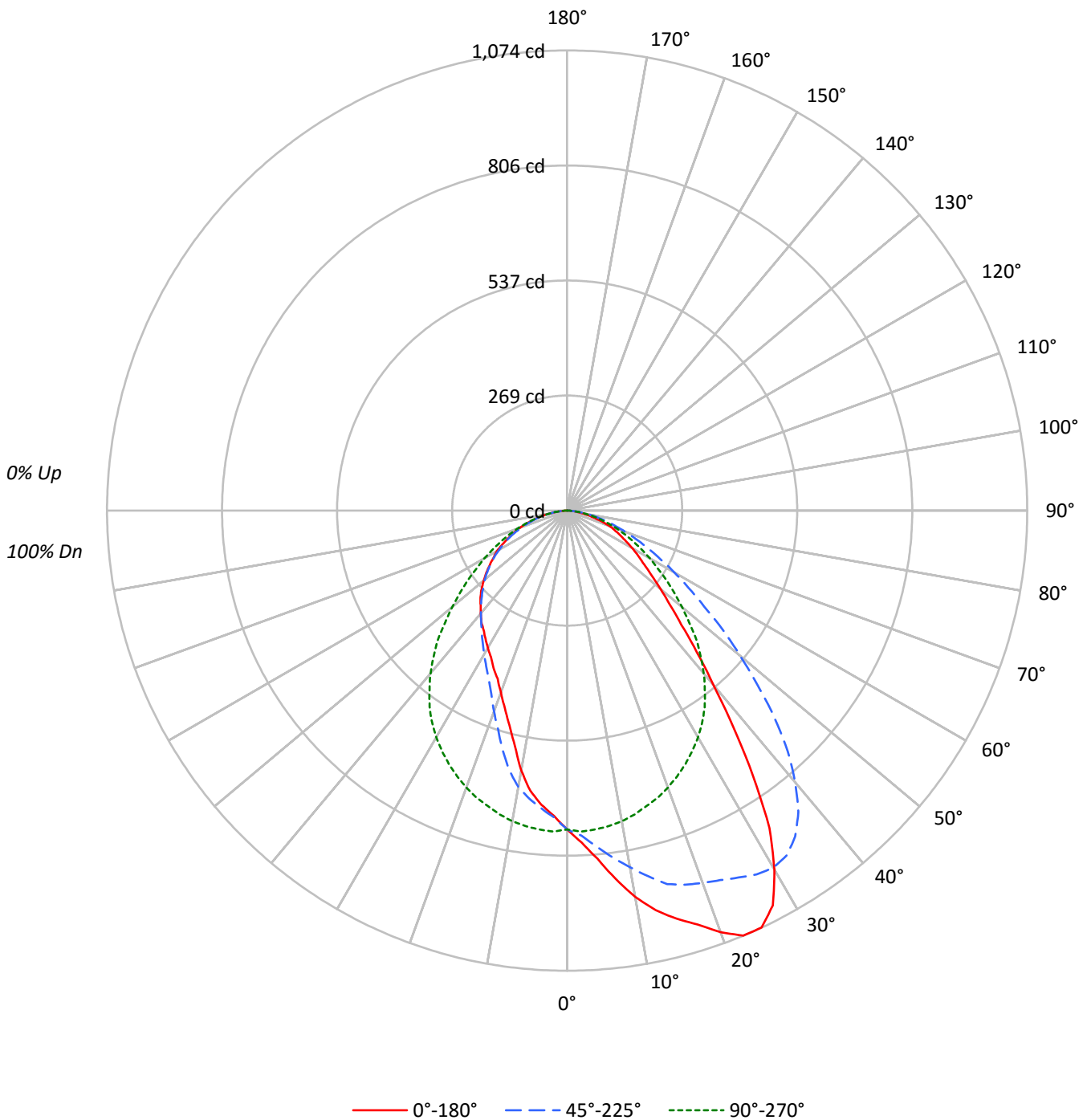
Input Watts (W): 18.8  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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°	22044	22044	22044
5°	24261	22224	20493
10°	27547	22144	18533
15°	30245	21899	15929
20°	33010	21684	14252
25°	35105	21342	13270
30°	33101	20898	12662
35°	27353	20241	12298
40°	20508	19192	12134
45°	15802	17897	11993
50°	13105	16101	11718
55°	11313	14619	11380
60°	10394	13185	11230
65°	9605	11919	10594
70°	9096	10708	10153
75°	7476	9456	9021
80°	5904	7695	7422
85°	4556	5643	4997



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	71.5	3.9
10°-20°	208.7	11.4
20°-30°	319.5	17.4
30°-40°	364.6	19.9
40°-50°	327.2	17.8
50°-60°	256.7	14.0
60°-70°	174.6	9.5
70°-80°	89.9	4.9
80°-90°	20.7	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°	599.8	32.7
0°-40°	964.4	52.6
0°-60°	1548.2	84.4
0°-90°	1833.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1833.4	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	744	744	744	744	744	
5°	816	787	747	697	689	81
15°	986	902	714	580	519	281
25°	1074	945	653	433	406	484
35°	756	928	560	347	340	469
45°	377	685	427	281	286	299
55°	219	391	283	218	220	200
65°	137	208	170	148	151	137
75°	65	92	83	76	79	70
85°	13	18	17	16	15	16
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°	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0
2.5°	775.4	775.4	776.7	776.4	775.1	772.8	770.9	768.7	762.9	759.1	762.6
5°	815.7	817.3	818.9	818.6	813.8	809.6	803.6	802.0	791.7	786.9	785.3
7.5°	867.0	866.6	867.3	861.8	857.7	853.5	845.5	835.6	823.4	816.7	810.3
10°	915.6	918.5	917.2	910.5	904.1	899.6	886.8	874.6	859.6	845.2	837.2
12.5°	955.3	953.7	959.2	952.8	945.1	936.7	924.3	913.4	893.8	874.3	858.0
15°	986.0	984.4	985.1	980.3	972.3	964.9	952.1	940.6	922.0	902.5	885.2
17.5°	1012.9	1014.5	1011.7	1005.9	995.0	986.4	970.4	954.7	935.1	915.6	898.6
20°	1046.9	1048.5	1043.0	1034.7	1024.1	1009.4	992.8	970.4	948.6	924.6	903.5
22.5°	1073.8	1072.8	1070.9	1062.9	1051.7	1037.9	1013.9	989.3	963.3	933.5	906.3
25°	1073.8	1075.0	1076.0	1071.8	1064.5	1053.0	1036.6	1010.7	981.6	945.1	907.0
27.5°	1039.2	1045.0	1049.1	1049.1	1047.5	1047.2	1037.6	1021.3	994.1	957.2	915.0
30°	967.5	975.2	981.6	991.5	1003.3	1011.0	1013.9	1007.5	993.4	962.4	918.5
32.5°	879.1	878.5	891.6	907.6	931.0	947.3	963.6	973.2	972.6	954.0	917.5
35°	756.2	765.1	780.8	803.2	833.3	860.2	895.8	914.3	929.1	928.4	905.1
37.5°	636.4	637.7	655.3	686.1	712.6	754.3	800.7	839.4	875.0	886.5	878.8
40°	530.2	539.1	551.0	576.6	603.2	639.7	698.6	750.4	794.3	828.2	837.5
42.5°	448.2	453.0	464.5	486.9	510.6	554.2	597.4	652.8	708.2	762.3	790.1
45°	377.1	381.6	392.2	407.9	430.0	464.2	508.7	562.5	621.7	685.1	724.8
47.5°	325.3	326.9	334.9	346.7	367.5	392.5	428.4	480.5	540.4	602.2	660.5
50°	284.3	286.9	292.3	301.6	316.9	340.3	368.8	408.2	463.6	527.6	586.8
52.5°	248.4	250.4	256.8	261.9	273.7	293.6	318.2	354.1	400.8	458.4	519.6
55°	219.0	220.9	224.1	229.9	239.1	252.6	273.7	302.2	342.2	390.9	448.2
57.5°	196.6	197.5	198.2	202.0	209.4	220.3	238.2	260.6	291.7	336.2	387.1
60°	175.4	175.1	177.7	180.6	185.0	191.8	204.9	225.1	252.9	289.1	336.5
62.5°	154.3	155.9	157.5	159.8	162.6	166.5	177.0	192.1	214.2	245.2	284.3
65°	137.0	137.3	138.6	138.9	142.5	146.3	154.3	164.6	182.8	208.1	240.4
67.5°	120.4	120.7	120.4	121.3	122.9	126.1	130.3	138.6	152.7	173.2	201.4
70°	105.0	104.0	102.8	104.4	106.0	107.6	110.5	116.9	127.4	142.8	166.2
72.5°	84.5	85.2	85.8	86.4	86.8	89.0	91.6	96.0	104.4	116.2	134.1
75°	65.3	65.3	66.3	66.9	69.8	70.4	73.3	76.5	83.2	91.6	105.6
77.5°	48.0	47.7	49.3	49.6	51.2	53.1	54.7	57.9	63.1	70.1	79.4
80°	34.6	34.9	34.6	34.6	35.5	36.8	39.1	40.7	44.2	48.7	55.4
82.5°	23.1	23.1	23.4	23.4	24.3	24.3	25.6	26.9	29.1	32.0	36.8
85°	13.4	13.4	13.1	13.1	13.4	13.4	14.7	15.7	16.0	17.9	19.5
87.5°	5.8	5.8	5.4	5.8	5.4	5.8	5.4	6.1	6.4	6.7	7.4
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°	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0
2.5°	761.6	760.7	760.3	756.8	753.3	749.1	748.5	749.8	744.3	737.6	737.3
5°	781.5	778.0	772.8	766.1	760.3	752.7	748.8	747.2	738.9	729.3	727.4
7.5°	803.6	794.9	785.6	775.4	765.1	753.9	746.9	742.7	731.2	719.4	714.6
10°	824.7	813.5	799.4	783.7	769.3	753.9	743.4	736.0	721.9	707.2	699.8
12.5°	849.0	830.5	810.6	791.1	773.5	753.6	737.6	726.4	710.1	694.4	683.5
15°	866.6	839.7	824.4	796.5	774.4	750.4	730.9	713.9	696.0	678.7	667.8
17.5°	880.4	859.3	832.4	801.6	771.9	745.9	721.6	702.7	679.0	660.1	648.3
20°	884.9	863.4	835.9	802.3	772.5	739.2	710.4	687.7	662.4	639.3	623.0
22.5°	883.3	859.0	830.8	797.8	767.7	728.3	698.2	671.0	642.9	618.2	595.8
25°	879.8	851.6	820.5	789.5	755.9	717.1	682.6	652.8	618.8	591.9	565.1
27.5°	877.8	841.0	806.1	772.5	740.5	703.0	665.9	632.6	595.2	562.5	527.9
30°	877.2	833.3	789.5	750.4	721.0	682.9	646.1	610.8	567.0	530.2	494.9
32.5°	875.9	826.9	775.4	728.7	695.0	660.8	621.7	586.8	537.2	498.8	461.0
35°	867.3	815.7	759.1	705.9	666.5	631.0	596.1	559.6	508.1	466.8	430.6
37.5°	848.7	803.6	743.1	683.2	636.1	600.0	567.6	527.9	478.0	432.8	399.2
40°	821.2	784.4	725.8	660.8	605.4	565.7	531.4	496.2	444.7	401.5	371.0
42.5°	785.3	756.8	701.8	634.5	575.6	531.1	496.2	461.3	413.9	372.3	345.1
45°	738.3	720.6	672.3	606.0	546.8	495.3	457.5	427.1	383.2	345.1	320.1
47.5°	686.1	678.4	638.1	574.3	511.9	462.0	417.8	385.8	351.5	319.2	297.1
50°	623.0	629.1	597.4	538.8	478.3	427.1	383.9	349.3	319.5	294.5	275.0
52.5°	564.1	578.5	552.9	497.2	443.1	389.9	346.4	314.7	291.3	270.8	253.9
55°	498.5	519.3	503.9	455.9	402.1	355.0	311.5	283.0	262.8	247.2	232.7
57.5°	435.4	464.9	453.6	410.4	364.6	318.9	277.9	249.7	235.3	223.8	211.6
60°	379.4	406.3	404.7	367.8	322.1	281.4	247.8	222.5	209.7	202.0	191.4
62.5°	329.1	356.3	353.8	320.5	284.3	246.5	218.0	195.0	185.7	177.4	170.6
65°	277.9	301.3	302.5	277.9	243.0	212.6	188.2	170.0	161.7	156.6	151.7
67.5°	231.5	254.2	256.4	236.9	206.2	179.9	161.7	146.3	138.9	134.5	130.9
70°	190.8	209.4	213.5	197.2	171.3	150.8	135.4	123.6	118.8	114.3	113.0
72.5°	154.6	169.7	172.6	157.5	138.3	122.9	111.1	102.1	98.6	94.1	93.2
75°	122.9	133.5	133.8	123.9	109.5	97.6	88.0	82.6	78.8	75.6	74.9
77.5°	89.3	98.6	101.5	94.1	82.3	72.4	66.9	62.7	60.2	58.6	58.3
80°	64.7	70.8	72.0	65.6	58.6	52.5	48.7	45.1	43.5	41.9	41.3
82.5°	40.3	45.8	46.1	41.6	38.1	33.9	30.7	29.5	28.5	27.5	27.5
85°	21.8	24.7	24.3	22.4	20.8	18.6	17.3	16.6	16.0	15.4	15.4
87.5°	8.3	9.3	9.3	9.6	8.3	7.4	6.7	7.0	6.7	6.7	6.7
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°	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0	744.0
2.5°	735.1	733.8	730.6	725.5	722.6	716.2	716.5	717.8	718.1	717.1	716.8
5°	721.9	718.1	713.0	706.6	702.1	697.3	694.1	696.0	695.0	694.7	693.1
7.5°	707.5	702.4	696.0	689.6	684.5	678.1	675.5	673.3	670.7	670.4	669.1
10°	693.1	686.7	679.3	670.1	663.0	655.0	647.3	643.2	638.4	634.8	627.5
12.5°	676.1	665.3	656.9	647.3	634.5	621.7	613.1	601.2	594.8	588.4	579.8
15°	656.6	642.5	628.1	608.9	597.7	579.8	567.0	558.3	548.4	542.0	534.6
17.5°	628.8	614.0	595.8	574.0	554.2	535.9	526.6	515.4	511.3	497.2	495.9
20°	601.2	579.1	556.4	534.3	512.2	499.1	487.3	479.9	472.2	463.3	460.4
22.5°	570.2	541.4	517.4	496.9	476.7	462.3	456.5	448.2	440.8	435.7	430.9
25°	532.4	505.8	481.5	462.3	444.0	433.2	425.8	419.7	416.5	410.7	408.8
27.5°	497.5	470.9	451.4	433.5	418.8	409.1	402.7	397.3	393.1	392.2	389.9
30°	462.0	439.2	420.7	405.3	392.2	387.1	381.0	378.4	375.9	374.6	372.0
32.5°	430.0	409.8	393.5	378.7	371.0	366.2	363.0	360.5	358.6	357.9	357.3
35°	400.8	382.3	368.8	358.2	352.5	347.4	345.8	343.5	342.6	342.2	341.9
37.5°	375.2	357.9	347.7	338.4	334.2	329.4	329.8	328.8	328.1	326.2	327.5
40°	349.3	335.8	325.3	317.9	315.0	313.4	312.8	312.1	312.5	312.5	312.1
42.5°	325.6	313.7	307.0	300.0	298.7	297.4	297.4	296.5	296.8	298.4	299.0
45°	304.1	294.9	288.8	283.0	283.0	281.4	282.7	282.4	283.3	284.3	284.9
47.5°	282.7	274.4	269.9	267.0	265.7	265.7	266.7	268.3	268.9	269.2	269.9
50°	261.2	255.2	251.3	249.7	249.4	251.0	252.0	251.6	252.6	253.9	254.8
52.5°	242.4	236.9	234.3	233.7	233.7	235.0	235.3	236.3	236.9	236.9	238.2
55°	222.8	219.0	217.1	216.7	217.1	217.7	219.0	219.6	219.3	219.9	219.9
57.5°	203.3	200.4	199.5	200.4	200.4	201.7	201.7	201.7	201.4	202.7	202.3
60°	185.0	181.8	182.8	182.5	183.4	183.4	184.4	184.4	183.4	184.7	185.4
62.5°	166.8	166.2	164.9	164.9	165.8	166.2	165.2	166.2	166.5	167.4	168.1
65°	147.6	145.3	146.3	146.0	146.9	148.5	147.3	147.3	148.2	149.5	150.1
67.5°	129.3	127.4	128.4	128.7	128.7	129.3	128.4	129.0	130.3	131.9	132.9
70°	110.8	110.1	110.5	110.1	110.1	111.7	112.1	111.7	113.0	114.6	114.9
72.5°	91.9	92.5	91.9	92.5	93.2	92.2	92.5	93.5	94.8	95.7	97.3
75°	74.6	73.6	74.0	75.6	75.2	75.9	75.6	76.5	78.8	78.1	78.4
77.5°	57.6	57.3	57.6	57.9	58.3	59.2	58.9	60.5	60.8	61.1	61.8
80°	41.0	41.3	41.6	42.3	43.2	42.9	43.5	43.9	45.1	43.9	44.8
82.5°	27.9	27.5	28.2	28.2	29.1	29.8	28.8	28.8	28.8	28.5	28.5
85°	15.4	16.3	16.3	16.3	15.7	15.7	16.0	15.7	15.7	15.7	15.4
87.5°	6.7	6.7	6.4	6.1	6.4	6.1	6.1	5.8	5.4	5.4	5.1
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: P242143

CATALOG NUMBER: S121DR-S490D940-X4F0-XX-UDD-A-W

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	744.0	744.0	744.0	744.0
2.5°	714.9	716.5	714.6	713.3
5°	691.5	691.5	689.6	689.0
7.5°	665.3	665.6	662.1	659.5
10°	625.9	624.0	618.8	616.0
12.5°	573.4	576.3	568.6	562.8
15°	527.6	519.6	522.8	519.3
17.5°	489.2	486.6	483.1	483.4
20°	455.6	453.6	451.7	452.0
22.5°	429.0	427.4	426.8	424.5
25°	406.9	407.5	405.9	405.9
27.5°	388.7	387.7	386.7	385.5
30°	371.4	371.7	370.7	370.1
32.5°	356.0	356.3	355.7	354.7
35°	341.0	340.6	341.0	340.0
37.5°	327.2	326.9	327.2	328.5
40°	313.1	313.4	312.5	313.7
42.5°	299.3	299.7	299.7	299.0
45°	284.3	285.2	285.6	286.2
47.5°	269.6	271.2	270.5	270.8
50°	254.8	254.5	254.5	254.2
52.5°	238.5	237.5	237.2	237.5
55°	219.0	220.3	220.3	220.3
57.5°	203.0	203.3	204.3	203.0
60°	186.6	186.6	187.0	189.5
62.5°	168.4	168.7	169.4	169.7
65°	150.8	151.7	151.4	151.1
67.5°	133.5	133.5	133.8	133.2
70°	115.6	115.6	115.6	117.2
72.5°	97.0	97.0	97.3	98.0
75°	79.7	79.7	79.7	78.8
77.5°	60.8	61.1	61.1	61.5
80°	44.2	43.9	43.9	43.5
82.5°	27.9	28.2	27.9	27.5
85°	15.4	15.7	14.7	14.7
87.5°	5.4	5.4	5.1	5.8
90°	0.0	0.0	0.0	0.0

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