

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: P242988

Luminaire Tested: **S121DR-H490D840-X4F0-XX-UDD-A-W**

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-08
Report Number: P242988
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-H490D840-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: 1938.2 lumens
Efficiency: N/A
Efficacy: 112.7 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

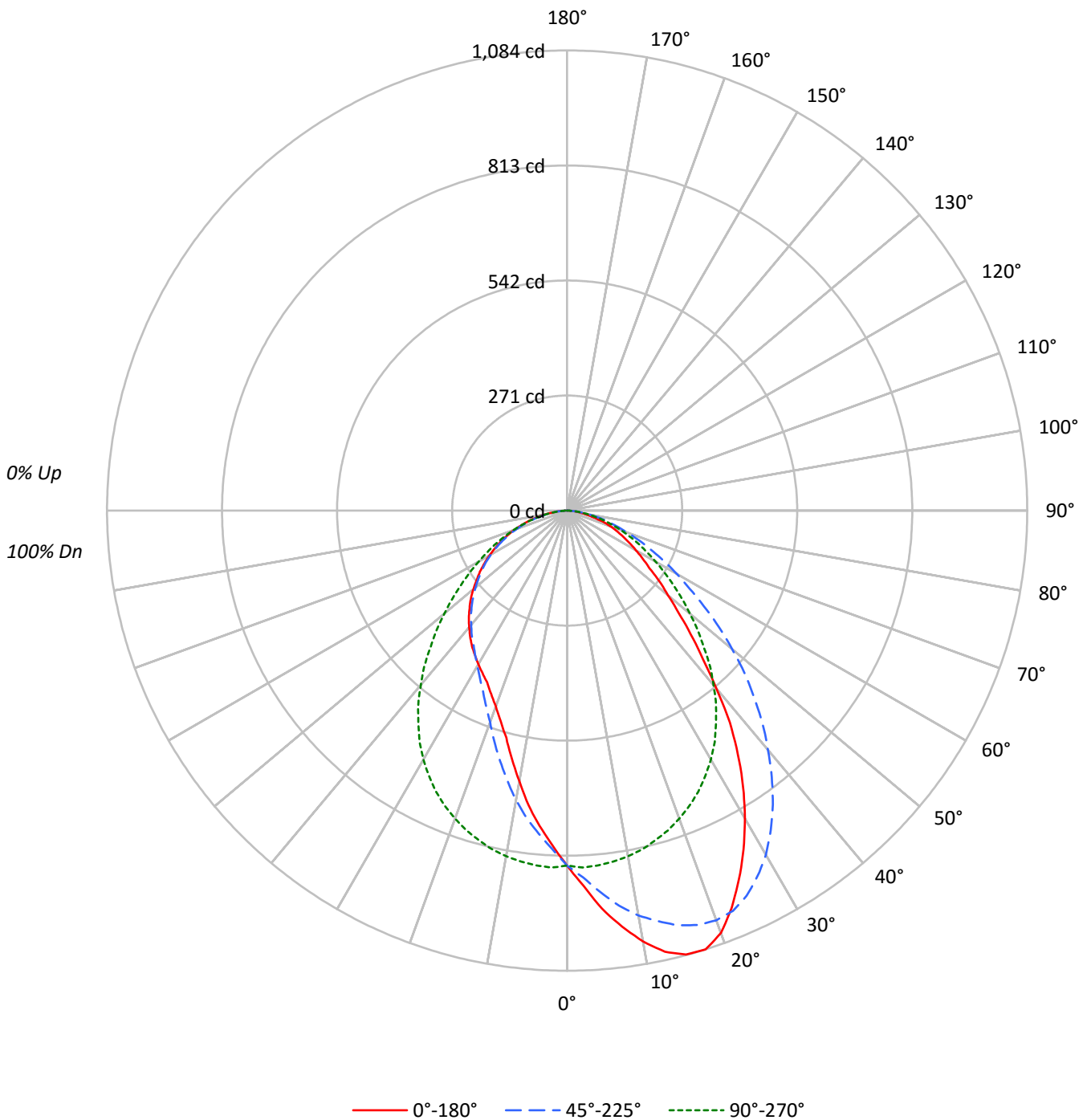
Input Watts (W): 17.2
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	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°	24779	24779	24779
5°	27997	24951	22170
10°	31013	24876	19487
15°	33212	24660	16997
20°	33395	24342	15476
25°	31323	23882	14594
30°	28657	23162	14305
35°	25378	22101	14125
40°	21146	20732	13882
45°	17239	19074	13627
50°	14308	17383	13285
55°	12243	15756	12940
60°	11093	14264	12527
65°	10243	12984	12087
70°	9451	11695	11375
75°	7636	10372	10486
80°	6092	8395	8958
85°	4589	6187	7309



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	79.9	4.1
10°-20°	228.9	11.8
20°-30°	333.3	17.2
30°-40°	371.5	19.2
40°-50°	343.5	17.7
50°-60°	273.6	14.1
60°-70°	187.3	9.7
70°-80°	97.2	5.0
80°-90°	23.0	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°	642.0	33.1
0°-40°	1013.5	52.3
0°-60°	1630.7	84.1
0°-90°	1938.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1938.2	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	836	836	836	836	836	
5°	941	902	839	764	745	92
15°	1083	1012	804	610	554	304
25°	958	1001	730	470	446	439
35°	702	845	611	384	390	435
45°	411	622	455	318	325	320
55°	237	393	305	244	250	217
65°	146	217	185	168	172	145
75°	67	98	91	86	92	73
85°	14	18	18	19	22	17
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°	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3
2.5°	884.7	884.7	882.4	883.4	882.0	879.7	876.0	871.9	866.9	864.9	863.9
5°	941.3	942.6	941.0	937.6	936.9	934.2	926.1	921.4	910.7	902.2	899.5
7.5°	988.4	990.8	990.8	984.7	982.0	975.3	969.6	961.8	948.4	938.9	931.2
10°	1030.8	1031.9	1028.2	1024.8	1019.4	1014.0	1004.2	994.5	980.0	968.6	955.8
12.5°	1064.5	1066.5	1063.8	1058.4	1052.1	1045.0	1032.9	1020.4	1006.3	990.8	977.0
15°	1082.7	1085.7	1086.1	1081.7	1077.0	1068.5	1059.8	1046.3	1030.8	1011.7	989.1
17.5°	1084.0	1085.4	1086.4	1083.0	1080.0	1077.0	1068.2	1057.1	1042.3	1023.4	1002.6
20°	1059.1	1062.2	1065.5	1062.5	1063.8	1063.8	1060.1	1054.4	1042.3	1027.1	1006.9
22.5°	1012.7	1019.7	1024.1	1027.1	1030.2	1034.5	1038.9	1036.2	1031.5	1020.4	1002.2
25°	958.1	963.8	972.3	975.0	977.3	990.1	997.9	1003.2	1003.2	1000.9	988.8
27.5°	900.2	903.9	911.0	920.4	929.2	936.9	953.1	963.2	971.3	971.3	964.9
30°	837.6	843.0	851.4	857.8	868.6	884.4	897.9	910.0	928.5	936.6	935.2
32.5°	771.6	777.0	785.8	791.1	806.6	819.4	840.3	859.1	880.4	892.5	899.9
35°	701.6	701.9	716.7	725.5	739.0	754.8	780.4	801.6	824.8	845.0	860.8
37.5°	629.5	629.2	639.6	655.1	665.9	688.1	714.4	738.0	770.3	791.8	816.7
40°	546.7	553.8	562.6	576.7	595.2	621.5	646.4	677.0	709.3	736.3	762.9
42.5°	472.7	478.4	492.5	508.4	528.2	550.4	580.7	614.7	646.4	681.4	711.0
45°	411.4	414.4	422.8	435.6	456.5	481.8	513.4	549.4	586.8	622.5	655.5
47.5°	354.8	363.9	368.3	380.1	395.2	418.8	451.8	484.1	527.2	566.9	603.0
50°	310.4	312.1	319.8	328.6	346.4	363.9	388.8	422.2	462.2	507.0	543.7
52.5°	274.0	273.4	279.8	287.5	300.0	318.5	340.0	372.3	406.3	450.8	490.8
55°	237.0	240.4	243.4	251.1	262.3	276.4	294.6	321.8	353.8	393.2	435.3
57.5°	211.4	211.8	213.4	219.8	227.2	238.4	255.9	279.1	307.7	342.0	382.8
60°	187.2	187.5	190.5	192.6	197.6	207.0	220.5	239.7	264.9	297.9	333.6
62.5°	166.3	166.6	168.3	170.3	175.1	178.8	190.2	206.7	227.2	256.5	287.2
65°	146.1	146.4	146.4	149.1	152.2	155.5	163.6	174.1	193.9	217.1	244.4
67.5°	126.6	128.6	127.9	129.9	132.6	134.3	140.0	149.5	162.9	182.5	206.0
70°	109.1	108.7	109.8	110.8	111.8	114.5	118.2	124.6	136.0	149.8	170.7
72.5°	90.2	88.2	89.6	90.9	92.6	94.6	97.6	102.3	111.1	122.2	137.7
75°	66.7	65.6	67.7	68.0	71.0	73.7	77.1	81.8	88.2	97.6	107.7
77.5°	48.5	49.8	50.5	51.2	51.5	54.5	58.2	62.3	66.0	74.7	82.5
80°	35.7	35.7	36.0	36.7	37.4	38.0	40.4	43.1	46.1	51.5	59.3
82.5°	24.9	24.6	24.6	24.9	25.2	25.9	26.9	27.9	30.6	33.3	37.4
85°	13.5	13.8	14.1	13.5	13.8	14.1	14.8	15.8	16.5	18.5	20.2
87.5°	4.7	5.7	5.4	5.4	5.7	5.7	5.7	6.4	6.4	6.4	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°	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3
2.5°	862.9	861.8	859.1	853.8	850.1	843.3	842.0	841.6	835.6	826.5	825.8
5°	894.8	887.1	880.7	871.3	861.8	850.4	843.7	838.9	828.2	814.7	808.7
7.5°	924.1	913.0	899.9	885.1	871.3	855.1	843.3	833.9	818.1	800.9	790.5
10°	947.7	933.9	917.4	897.5	878.7	857.5	841.0	826.8	806.0	784.7	770.6
12.5°	963.8	948.4	929.5	906.3	883.4	859.1	835.2	817.4	791.1	766.6	748.4
15°	982.0	956.4	936.9	910.7	883.7	854.8	829.5	803.9	773.6	746.0	722.5
17.5°	986.4	962.8	939.6	910.7	882.7	847.4	818.1	789.8	756.1	722.1	699.2
20°	990.4	963.5	934.9	903.6	874.3	837.9	804.9	772.0	732.9	696.2	667.6
22.5°	987.4	961.2	929.2	893.8	862.2	824.8	789.1	752.8	709.0	670.6	638.3
25°	978.7	954.4	921.4	882.7	844.7	806.6	769.3	730.5	683.1	638.6	603.0
27.5°	960.8	939.3	907.6	866.6	826.5	784.4	745.4	705.0	654.1	608.7	570.6
30°	936.9	919.7	887.8	846.7	803.3	758.2	718.1	677.0	624.2	574.7	534.3
32.5°	903.9	891.8	864.2	824.1	777.3	729.5	688.5	646.7	590.2	543.0	502.0
35°	866.9	861.2	836.6	796.5	748.1	697.9	653.8	611.0	558.9	509.0	469.6
37.5°	823.5	827.5	805.3	765.6	715.4	664.2	617.8	576.4	523.5	475.7	437.0
40°	780.4	786.4	769.6	732.6	680.4	627.5	580.4	536.0	486.8	444.7	406.3
42.5°	732.6	744.7	731.6	695.5	644.7	588.8	539.7	498.3	451.5	412.7	379.1
45°	681.7	697.2	691.8	655.1	605.0	550.1	498.3	455.2	417.5	383.1	352.5
47.5°	630.2	648.1	645.7	615.1	566.9	510.7	459.5	417.1	382.4	354.8	329.3
50°	577.4	595.5	595.9	568.6	523.8	470.3	415.4	377.1	349.4	325.2	304.3
52.5°	525.9	544.0	544.4	523.2	478.4	426.2	375.7	340.7	317.1	298.3	280.8
55°	472.0	493.2	495.2	474.7	435.0	384.8	338.3	305.0	284.1	272.0	256.9
57.5°	417.5	440.3	444.4	427.9	389.5	342.7	303.7	271.7	254.8	246.4	235.0
60°	366.6	389.2	395.6	376.7	345.1	305.0	267.6	240.7	227.2	220.5	212.4
62.5°	319.8	342.4	345.7	329.6	298.3	264.6	236.3	211.8	200.6	195.6	189.2
65°	274.0	294.2	298.6	284.1	255.9	227.9	203.0	185.2	175.4	171.0	167.0
67.5°	232.0	250.8	253.8	240.7	217.1	193.2	175.1	159.6	152.8	147.1	145.4
70°	192.2	209.4	212.1	199.0	180.4	160.9	145.8	135.0	128.6	125.2	122.9
72.5°	155.5	169.0	171.4	163.3	148.8	131.6	119.8	110.8	106.7	103.7	102.7
75°	121.5	134.7	135.0	127.9	116.1	104.4	95.3	90.6	85.8	82.8	82.1
77.5°	93.3	100.7	101.7	98.0	86.5	79.1	72.0	68.7	67.0	64.0	64.0
80°	66.7	71.0	72.7	67.3	61.9	55.5	51.8	49.2	47.8	45.8	45.8
82.5°	41.4	45.1	47.1	43.1	40.4	37.0	34.3	32.7	31.6	30.6	30.3
85°	22.6	25.2	25.2	23.9	21.5	19.9	18.9	18.2	17.8	17.5	17.2
87.5°	8.1	10.1	9.1	9.4	8.4	8.1	7.7	7.7	8.1	7.4	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):

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3	836.3
2.5°	821.4	819.8	814.7	810.0	806.3	798.2	796.5	797.2	797.2	797.5	793.8
5°	801.6	794.5	786.4	779.0	773.3	764.2	759.2	757.8	756.8	754.8	751.1
7.5°	779.0	770.9	759.5	752.8	740.6	730.5	723.5	718.8	715.7	711.4	705.3
10°	756.1	744.3	731.6	718.1	706.0	692.5	681.4	676.0	669.6	665.2	658.5
12.5°	733.2	716.7	699.2	683.8	667.3	651.4	640.0	632.6	621.1	614.7	607.7
15°	703.3	683.1	668.3	641.3	633.3	610.4	596.6	590.8	579.7	577.7	566.6
17.5°	675.0	651.8	629.9	607.3	585.8	570.0	558.2	550.8	542.0	536.6	529.2
20°	639.6	615.4	589.1	565.6	547.4	530.6	523.2	513.7	508.7	503.3	497.9
22.5°	606.0	576.4	550.1	530.9	512.4	498.6	490.5	484.1	479.7	474.3	470.6
25°	570.0	542.4	518.1	498.3	480.4	469.6	462.9	459.2	456.5	452.5	450.1
27.5°	535.6	507.7	483.8	468.6	454.2	444.7	441.4	438.0	434.6	433.3	432.9
30°	498.9	473.3	453.8	440.7	427.6	422.5	420.8	417.5	418.1	418.5	417.5
32.5°	468.0	443.0	428.2	417.1	407.0	403.3	403.0	401.6	402.0	403.7	403.0
35°	436.0	417.5	402.6	393.6	387.2	384.5	384.8	385.1	387.2	387.5	388.8
37.5°	408.7	390.9	381.1	372.3	369.3	369.3	369.6	370.0	371.7	373.7	374.4
40°	381.8	367.3	358.9	353.2	351.5	351.5	352.8	354.5	355.5	357.5	357.9
42.5°	357.5	345.4	339.0	333.3	334.0	335.6	336.0	337.0	339.7	340.0	340.7
45°	333.6	324.5	318.1	316.5	316.5	317.8	319.5	320.2	322.2	322.5	323.2
47.5°	313.1	303.7	299.0	297.3	298.3	300.0	302.3	303.3	305.0	304.7	306.4
50°	290.2	282.5	278.8	278.1	278.8	281.8	282.8	285.1	286.8	287.8	288.5
52.5°	268.3	262.3	260.6	260.2	261.6	263.6	264.9	267.3	269.3	269.3	269.0
55°	247.4	242.1	240.0	241.7	243.4	244.4	247.1	248.5	250.5	250.8	250.5
57.5°	226.2	221.5	220.8	221.5	224.9	226.9	228.6	228.6	229.6	229.9	230.9
60°	204.4	201.3	200.6	202.3	206.0	207.4	208.4	208.7	210.1	209.4	211.4
62.5°	183.8	180.8	182.1	183.8	185.2	187.2	187.9	189.5	189.2	189.9	190.9
65°	162.6	160.9	161.3	163.3	165.0	167.7	167.7	167.7	169.3	169.3	170.0
67.5°	142.1	141.1	142.4	144.1	144.4	146.1	145.8	147.8	149.1	149.8	150.5
70°	122.2	121.5	121.5	123.2	124.9	125.6	126.2	127.6	127.9	128.9	130.6
72.5°	103.4	101.3	101.7	104.0	104.0	105.4	107.1	107.1	109.1	109.4	111.1
75°	82.8	82.1	82.8	84.2	85.8	85.5	87.5	87.2	87.9	90.2	90.6
77.5°	64.6	63.6	65.3	66.0	66.3	66.7	67.3	69.0	70.4	71.4	71.7
80°	46.5	46.1	47.8	48.5	48.1	48.8	49.8	51.5	51.5	52.2	53.2
82.5°	31.3	30.6	31.6	32.7	33.3	33.7	33.7	34.3	34.7	35.3	35.3
85°	17.8	17.8	18.5	18.9	19.5	19.2	19.9	19.5	20.2	20.9	20.5
87.5°	7.7	7.7	7.7	7.7	8.1	8.1	8.4	8.4	8.1	8.4	7.7
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):

	165°	170°	175°	180°
0°	836.3	836.3	836.3	836.3
2.5°	792.5	793.2	791.5	789.8
5°	750.7	748.4	746.0	745.4
7.5°	703.9	703.9	698.2	699.6
10°	653.8	651.8	647.4	647.7
12.5°	605.0	603.3	600.9	599.9
15°	560.9	561.9	563.6	554.1
17.5°	526.2	523.5	522.2	520.5
20°	495.2	493.9	491.2	490.8
22.5°	471.3	468.3	467.6	468.0
25°	448.4	448.4	448.4	446.4
27.5°	432.3	432.3	431.3	431.6
30°	418.1	418.8	417.8	418.1
32.5°	404.7	405.0	404.3	404.0
35°	389.5	390.5	390.2	390.5
37.5°	375.0	375.7	375.0	375.0
40°	358.5	360.2	359.9	358.9
42.5°	342.0	342.0	343.1	342.7
45°	324.9	324.2	324.2	325.2
47.5°	306.7	308.0	307.4	307.7
50°	289.9	289.5	288.5	288.2
52.5°	270.0	270.7	270.3	268.7
55°	250.8	250.8	250.5	250.5
57.5°	230.3	231.3	230.9	230.9
60°	210.7	211.4	211.8	211.4
62.5°	190.9	191.2	190.9	191.2
65°	171.7	171.7	171.4	172.4
67.5°	150.8	151.2	150.8	151.5
70°	131.0	131.6	132.0	131.3
72.5°	112.1	111.4	111.8	111.1
75°	91.2	91.6	91.2	91.6
77.5°	71.7	72.0	71.7	72.0
80°	52.9	52.9	53.2	52.5
82.5°	35.7	35.7	36.7	35.7
85°	20.9	20.9	20.2	21.5
87.5°	8.1	8.1	8.1	8.1
90°	0.0	0.0	0.0	0.0

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