

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: P231596

Luminaire Tested: **S121-DR-1-30-X-0048-1-U-DD-4-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P231596  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P33907)  
Test Lab: INNOVATION CENTER-P3  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: NEO-RAY  
Catalog Number: S121-DR-1-30-X-0048-1-U-DD-4-W  
Description: DEFINE 1 LED LINEAR DIRECT RECESSED LED LUMINAIRE WITH DROP LENS.  
Light Source: 3000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2404.5 lumens  
Efficiency: N/A  
Efficacy: 86.2 lumens/watt  
Spacing Criteria (0/90/45): 1.21 / 1.42 / 1.49  
Luminous Opening: Rectangular w/ Sides (W: 0.1' x L: 3.92' x H: 0.08')  
CIE Type: Semi-Direct

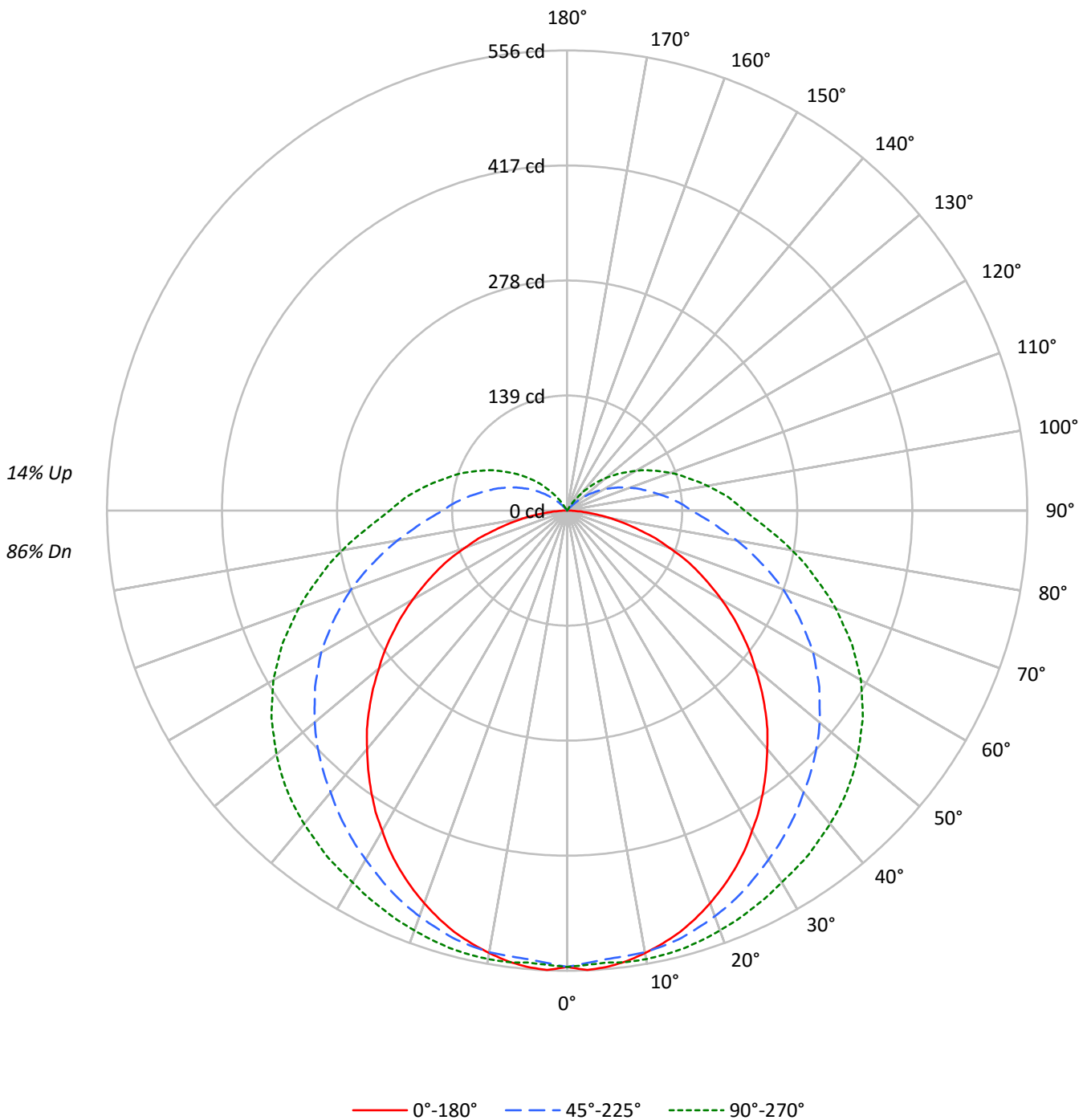
Input Watts (W): 27.9  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



TEST NUMBER: P231596

CATALOG NUMBER: S121-DR-1-30-X-0048-1-U-DD-4-W

### 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	116	116	116	116	112	112	112	112	104	104	104	96	96	96	90	90	90	86
1	103	97	91	86	98	93	88	84	86	82	79	80	77	74	74	72	69	66
2	92	83	75	68	88	79	72	66	74	68	62	68	63	59	63	59	56	53
3	83	72	62	55	80	69	61	54	64	57	51	59	53	49	55	50	46	43
4	76	63	53	46	72	61	52	45	56	49	43	52	46	41	48	43	39	36
5	69	56	46	39	66	54	45	38	50	42	36	47	40	35	43	38	33	31
6	64	50	40	34	61	48	39	33	45	37	32	42	35	30	39	33	29	26
7	59	45	36	29	57	44	35	29	41	33	28	38	31	27	36	30	25	23
8	55	41	32	26	53	40	31	26	37	30	25	35	28	24	33	27	23	20
9	51	37	29	23	49	36	28	23	34	27	22	32	26	21	30	24	20	18
10	48	34	26	21	46	33	26	21	31	25	20	30	23	19	28	22	18	16

**AVERAGE LUMINANCE (cd/sqm):**

	0°	45°	90°
0°	15416	15416	15416
5°	15505	14488	14323
10°	15355	13880	13591
15°	15170	13284	12907
20°	14906	12688	12274
25°	14616	12133	11725
30°	14249	11603	11242
35°	13889	11143	10883
40°	13482	10710	10543
45°	13085	10348	10241
50°	12590	9999	9920
55°	12143	9654	9620
60°	11622	9301	9285
65°	11027	8864	8904
70°	10117	8449	8483
75°	8987	7936	8032
80°	7586	7473	7645
85°	5187	7055	7261



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	52.3	2.2
10°-20°	151.4	6.3
20°-30°	233.4	9.7
30°-40°	291.0	12.1
40°-50°	321.7	13.4
50°-60°	322.6	13.4
60°-70°	293.0	12.2
70°-80°	238.0	9.9
80°-90°	174.1	7.2
90°-100°	127.1	5.3
100°-110°	91.0	3.8
110°-120°	59.5	2.5
120°-130°	33.3	1.4
130°-140°	13.8	0.6
140°-150°	2.2	0.1
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	437.1	18.2
0°-40°	728.1	30.3
0°-60°	1372.4	57.1
0°-90°	2077.5	86.4
90°-120°	277.7	11.5
90°-150°	327.0	13.6
90°-180°	327.0	13.6
0°-180°	2404.5	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	551	551	551	551	551	
5°	554	550	544	549	548	52
15°	527	527	534	547	547	148
25°	478	489	506	526	530	220
35°	413	434	467	498	508	258
45°	338	372	422	466	478	261
55°	257	304	372	420	436	230
65°	174	234	310	362	379	172
75°	90	162	242	293	310	96
85°	20	97	176	226	242	24
90°	0	73	150	199	214	1
95°	0	58	132	178	194	0
105°	0	34	96	138	151	0
115°	0	14	66	102	114	0
125°	0	1	37	68	78	0
135°	0	0	12	36	45	0
145°	0	0	0	6	13	0
155°	0	0	0	0	0	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	0



TEST NUMBER: P231596

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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	551.4	551.4	551.4	551.4	551.4	551.4	551.4	551.4	551.4	551.4	551.4
2.5°	555.6	553.5	551.4	552.4	552.4	553.5	551.4	551.4	549.3	547.2	547.2
5°	553.5	551.4	548.2	549.3	549.3	550.3	549.3	548.2	546.1	544.0	545.0
7.5°	549.3	547.2	544.0	545.0	545.0	545.0	545.0	545.0	544.0	542.9	544.0
10°	542.9	540.8	538.7	538.7	538.7	540.8	540.8	541.9	541.9	541.9	544.0
12.5°	535.5	533.4	531.3	531.3	532.4	535.5	536.6	537.6	538.7	538.7	540.8
15°	527.1	523.9	521.8	523.9	525.0	529.2	531.3	532.4	533.4	534.5	537.6
17.5°	516.5	514.4	511.2	513.4	516.5	521.8	523.9	526.0	528.1	528.1	532.4
20°	504.9	502.8	499.6	503.8	508.1	512.3	515.5	517.6	519.7	521.8	526.0
22.5°	492.2	489.1	488.0	493.3	497.5	502.8	506.0	509.1	511.2	514.4	519.7
25°	478.5	475.3	475.3	480.6	485.9	491.2	495.4	499.6	501.7	506.0	511.2
27.5°	463.7	460.5	461.6	467.9	472.2	479.5	483.8	489.1	492.2	496.4	502.8
30°	446.8	443.6	445.7	453.1	459.5	466.9	472.2	476.4	481.7	486.9	494.3
32.5°	431.0	426.7	429.9	438.4	444.7	453.1	459.5	464.8	471.1	477.4	484.8
35°	413.0	409.8	414.1	422.5	429.9	438.4	445.7	452.1	459.5	466.9	475.3
37.5°	395.0	390.8	397.2	405.6	415.1	423.6	432.0	438.4	446.8	456.3	465.8
40°	376.0	372.9	380.3	389.8	398.2	407.7	417.2	424.6	435.2	444.7	455.3
42.5°	358.1	354.9	363.4	371.8	382.4	392.9	403.5	410.9	422.5	434.1	444.7
45°	338.0	335.9	344.3	354.9	366.5	378.1	387.7	398.2	410.9	422.5	434.1
47.5°	317.9	315.8	325.3	337.0	348.6	361.2	372.9	385.5	398.2	410.9	422.5
50°	296.8	296.8	307.4	319.0	330.6	345.4	357.0	371.8	384.5	398.2	409.8
52.5°	277.8	277.8	288.4	300.0	313.7	328.5	343.3	357.0	371.8	384.5	398.2
55°	256.7	258.8	270.4	282.0	295.8	311.6	327.4	342.2	358.1	371.8	384.5
57.5°	236.6	239.8	250.3	263.0	278.9	295.8	311.6	327.4	342.2	357.0	370.8
60°	215.5	219.7	231.3	245.1	260.9	278.9	295.8	311.6	327.4	343.3	356.0
62.5°	194.4	199.6	211.3	225.0	242.9	260.9	278.9	294.7	311.6	326.4	340.1
65°	174.3	179.6	191.2	206.0	225.0	244.0	262.0	278.9	295.8	310.5	325.3
67.5°	154.2	159.5	172.2	188.0	207.0	226.0	244.0	262.0	278.9	293.6	307.4
70°	131.0	139.4	152.1	169.0	189.1	208.1	227.1	244.0	260.9	277.8	291.5
72.5°	112.0	119.4	133.1	151.0	170.1	190.1	209.1	227.1	244.0	259.8	273.6
75°	89.8	98.2	113.0	132.0	152.1	172.2	191.2	209.1	226.0	241.9	256.7
77.5°	70.8	79.2	95.1	114.1	134.1	154.2	174.3	192.2	209.1	225.0	238.7
80°	52.8	61.3	78.2	97.2	118.3	138.4	157.4	175.3	192.2	208.1	221.8
82.5°	35.9	44.4	62.3	81.3	101.4	121.5	140.5	158.4	175.3	191.2	206.0
85°	20.1	30.6	47.5	66.5	86.6	106.7	125.7	144.7	160.6	176.4	191.2
87.5°	8.5	20.1	35.9	53.9	73.9	94.0	113.0	129.9	147.9	162.7	176.4
90°	0.0	10.6	25.4	43.3	63.4	82.4	101.4	118.3	135.2	150.0	163.7
92.5°	0.0	6.3	20.1	37.0	56.0	75.0	93.0	110.9	126.8	141.5	155.3
95°	0.0	3.2	14.8	31.7	48.6	66.5	84.5	101.4	117.2	132.0	144.7
97.5°	0.0	1.1	11.6	25.4	42.3	60.2	77.1	94.0	108.8	122.5	135.2
100°	0.0	0.0	8.5	21.1	37.0	52.8	69.7	85.6	100.3	113.0	125.7
102.5°	0.0	0.0	4.2	16.9	31.7	46.5	62.3	77.1	91.9	104.6	117.2
105°	0.0	0.0	2.1	12.7	26.4	41.2	56.0	69.7	83.4	96.1	108.8
107.5°	0.0	0.0	0.0	8.5	21.1	34.9	49.6	63.4	77.1	88.7	99.3
110°	0.0	0.0	0.0	5.3	16.9	29.6	43.3	56.0	68.7	80.3	91.9



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
112.5°	0.0	0.0	0.0	2.1	12.7	24.3	37.0	49.6	61.3	72.9	83.4
115°	0.0	0.0	0.0	0.0	8.5	19.0	31.7	43.3	54.9	65.5	76.1
117.5°	0.0	0.0	0.0	0.0	4.2	14.8	25.4	37.0	47.5	58.1	67.6
120°	0.0	0.0	0.0	0.0	1.1	10.6	20.1	31.7	41.2	51.8	60.2
122.5°	0.0	0.0	0.0	0.0	0.0	5.3	14.8	25.4	34.9	44.4	52.8
125°	0.0	0.0	0.0	0.0	0.0	2.1	10.6	19.0	28.5	37.0	46.5
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	5.3	13.7	22.2	30.6	39.1
130°	0.0	0.0	0.0	0.0	0.0	0.0	2.1	8.5	16.9	24.3	31.7
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	10.6	18.0	24.3
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.3	11.6	18.0
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	6.3	11.6
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	6.3
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
145°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	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°
0°	551.4	551.4	551.4	551.4	551.4	551.4	551.4	551.4
2.5°	549.3	550.3	551.4	550.3	550.3	551.4	550.3	549.3
5°	547.2	548.2	549.3	549.3	550.3	550.3	549.3	548.2
7.5°	547.2	549.3	550.3	551.4	551.4	552.4	551.4	550.3
10°	547.2	548.2	550.3	551.4	551.4	552.4	551.4	550.3
12.5°	545.0	547.2	549.3	549.3	550.3	551.4	550.3	549.3
15°	540.8	542.9	546.1	547.2	548.2	548.2	547.2	547.2
17.5°	536.6	538.7	541.9	542.9	544.0	545.0	544.0	544.0
20°	530.3	533.4	536.6	538.7	539.8	540.8	540.8	539.8
22.5°	523.9	528.1	531.3	532.4	534.5	536.6	535.5	535.5
25°	516.5	520.7	525.0	527.1	529.2	531.3	530.3	530.3
27.5°	509.1	513.4	517.6	520.7	523.9	525.0	525.0	525.0
30°	499.6	506.0	510.2	513.4	516.5	518.6	518.6	518.6
32.5°	491.2	497.5	502.8	506.0	510.2	512.3	513.4	513.4
35°	482.7	489.1	495.4	499.6	503.8	507.0	507.0	508.1
37.5°	473.2	481.7	488.0	493.3	497.5	500.7	501.7	500.7
40°	464.8	473.2	479.5	485.9	490.1	493.3	494.3	494.3
42.5°	454.2	463.7	471.1	477.4	482.7	485.9	486.9	486.9
45°	444.7	454.2	462.6	469.0	473.2	476.4	478.5	478.5
47.5°	434.1	443.6	451.0	458.4	463.7	466.9	467.9	469.0
50°	422.5	432.0	439.4	447.9	453.1	456.3	457.4	458.4
52.5°	409.8	419.3	428.8	436.2	441.5	445.7	446.8	446.8
55°	397.2	406.7	416.2	423.6	429.9	433.1	435.2	436.2
57.5°	382.4	392.9	402.4	410.9	416.2	420.4	422.5	422.5
60°	368.6	379.2	388.7	397.2	402.4	406.7	407.7	409.8
62.5°	352.8	363.4	373.9	381.3	386.6	390.8	392.9	394.0
65°	337.0	348.6	359.1	365.5	370.8	376.0	378.1	379.2
67.5°	320.1	331.7	341.2	349.6	353.9	359.1	361.2	361.2
70°	304.2	315.8	324.3	331.7	338.0	342.2	344.3	345.4
72.5°	287.3	297.9	307.4	314.8	320.1	324.3	327.4	327.4
75°	268.3	279.9	289.4	296.8	303.2	307.4	309.5	309.5
77.5°	252.5	263.0	271.5	279.9	286.3	290.5	292.6	293.6
80°	234.5	245.1	254.6	262.0	268.3	272.5	274.6	275.7
82.5°	218.6	229.2	237.7	246.1	251.4	255.6	257.7	258.8
85°	202.8	213.4	222.9	229.2	235.5	238.7	241.9	241.9
87.5°	189.1	198.6	208.1	214.4	220.8	225.0	227.1	227.1
90°	175.3	185.9	194.4	202.8	208.1	212.3	213.4	214.4
92.5°	165.8	176.4	184.8	192.2	197.5	200.7	203.9	203.9
95°	156.3	165.8	175.3	181.7	187.0	191.2	193.3	194.4
97.5°	146.8	156.3	164.8	171.1	176.4	180.6	181.7	182.7
100°	137.3	146.8	154.2	160.6	165.8	169.0	172.2	172.2
102.5°	127.8	137.3	144.7	151.0	156.3	159.5	161.6	161.6
105°	118.3	127.8	135.2	141.5	145.8	150.0	151.0	151.0
107.5°	109.9	119.4	126.8	132.0	136.3	140.5	142.6	142.6
110°	101.4	109.9	117.2	122.5	127.8	131.0	133.1	133.1





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CATALOG NUMBER: S121-DR-1-30-X-0048-1-U-DD-4-W

**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°
112.5°	93.0	101.4	108.8	114.1	118.3	121.5	123.6	123.6
115°	84.5	93.0	99.3	105.6	109.9	113.0	114.1	114.1
117.5°	77.1	84.5	90.8	96.1	100.3	103.5	105.6	105.6
120°	68.7	76.1	82.4	87.7	91.9	94.0	96.1	96.1
122.5°	61.3	67.6	73.9	79.2	82.4	85.6	87.7	86.6
125°	53.9	60.2	65.5	70.8	73.9	77.1	78.2	78.2
127.5°	45.4	51.8	58.1	62.3	65.5	68.7	69.7	69.7
130°	38.0	44.4	49.6	53.9	57.0	59.2	61.3	61.3
132.5°	31.7	37.0	42.3	45.4	48.6	50.7	52.8	52.8
135°	24.3	29.6	33.8	38.0	41.2	43.3	44.4	45.4
137.5°	16.9	22.2	26.4	30.6	32.7	34.9	35.9	35.9
140°	10.6	14.8	19.0	22.2	24.3	26.4	27.5	28.5
142.5°	4.2	8.5	11.6	14.8	16.9	18.0	19.0	19.0
145°	0.0	2.1	5.3	7.4	9.5	11.6	11.6	12.7
147.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
152.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
155°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
157.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
162.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
165°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
167.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
172.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
175°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
177.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)