

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: P231591

Luminaire Tested: **S121-DR-LO-27-X-0048-1-U-DD-4-W**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P231591  
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-LO-27-X-0048-1-U-DD-4-W  
Description: DEFINE 1 LED LINEAR DIRECT RECESSED LED LUMINAIRE WITH DROP LENS.  
Light Source: 2700K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 950.5 lumens  
Efficiency: N/A  
Efficacy: 69.9 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

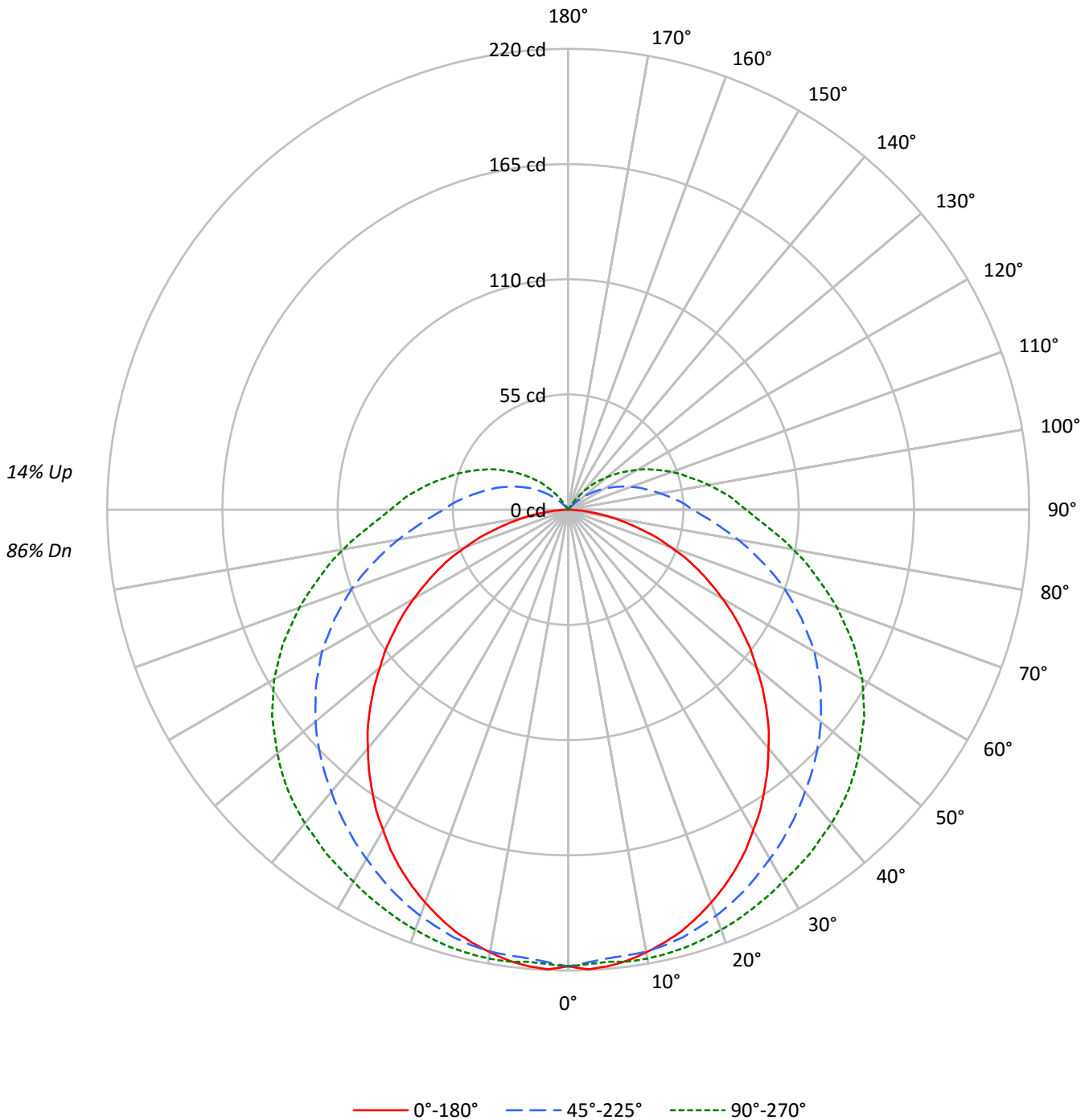
Input Watts (W): 13.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



TEST NUMBER: P231591

CATALOG NUMBER: S121-DR-LO-27-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°	6095	6095	6095
5°	6129	5726	5662
10°	6069	5487	5374
15°	5998	5251	5102
20°	5893	5016	4852
25°	5779	4796	4634
30°	5632	4587	4444
35°	5492	4406	4301
40°	5332	4234	4168
45°	5172	4090	4049
50°	4976	3953	3921
55°	4801	3817	3804
60°	4595	3676	3671
65°	4359	3506	3520
70°	4000	3339	3352
75°	3553	3137	3174
80°	3003	2955	3023
85°	2039	2787	2870



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	20.7	2.2
10°-20°	59.9	6.3
20°-30°	92.3	9.7
30°-40°	115.0	12.1
40°-50°	127.2	13.4
50°-60°	127.5	13.4
60°-70°	115.8	12.2
70°-80°	94.1	9.9
80°-90°	68.8	7.2
90°-100°	50.2	5.3
100°-110°	36.0	3.8
110°-120°	23.5	2.5
120°-130°	13.2	1.4
130°-140°	5.4	0.6
140°-150°	0.9	0.1
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	172.8	18.2
0°-40°	287.8	30.3
0°-60°	542.5	57.1
0°-90°	821.3	86.4
90°-120°	109.8	11.5
90°-150°	129.2	13.6
90°-180°	129.0	13.6
0°-180°	950.5	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	218	218	218	218	218	
5°	219	217	215	217	217	21
15°	208	208	211	216	216	59
25°	189	193	200	208	210	87
35°	163	172	185	197	201	102
45°	134	147	167	184	189	103
55°	102	120	147	166	172	91
65°	69	93	123	143	150	68
75°	36	64	96	116	122	38
85°	8	38	70	89	96	9
90°	0	29	59	78	85	0
95°	0	23	52	71	77	0
105°	0	13	38	55	60	0
115°	0	5	26	41	45	0
125°	0	0	15	27	31	0
135°	0	0	5	14	18	0
145°	0	0	0	2	5	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: P231591

CATALOG NUMBER: S121-DR-LO-27-X-0048-1-U-DD-4-W

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0
2.5°	219.6	218.8	218.0	218.4	218.4	218.8	218.0	218.0	217.1	216.3	216.3
5°	218.8	218.0	216.7	217.1	217.1	217.6	217.1	216.7	215.9	215.0	215.5
7.5°	217.1	216.3	215.0	215.5	215.5	215.5	215.5	215.5	215.0	214.6	215.0
10°	214.6	213.8	213.0	213.0	213.0	213.8	213.8	214.2	214.2	214.2	215.0
12.5°	211.7	210.9	210.0	210.0	210.5	211.7	212.1	212.5	213.0	213.0	213.8
15°	208.4	207.1	206.3	207.1	207.5	209.2	210.0	210.5	210.9	211.3	212.5
17.5°	204.2	203.4	202.1	202.9	204.2	206.3	207.1	207.9	208.8	208.8	210.5
20°	199.6	198.8	197.5	199.2	200.8	202.5	203.8	204.6	205.4	206.3	207.9
22.5°	194.6	193.3	192.9	195.0	196.7	198.8	200.0	201.3	202.1	203.4	205.4
25°	189.2	187.9	187.9	190.0	192.1	194.2	195.8	197.5	198.3	200.0	202.1
27.5°	183.3	182.1	182.5	185.0	186.7	189.6	191.2	193.3	194.6	196.3	198.8
30°	176.6	175.4	176.2	179.1	181.6	184.6	186.7	188.3	190.4	192.5	195.4
32.5°	170.4	168.7	169.9	173.3	175.8	179.1	181.6	183.7	186.2	188.7	191.7
35°	163.3	162.0	163.7	167.0	169.9	173.3	176.2	178.7	181.6	184.6	187.9
37.5°	156.2	154.5	157.0	160.3	164.1	167.4	170.8	173.3	176.6	180.4	184.1
40°	148.7	147.4	150.3	154.1	157.4	161.2	164.9	167.9	172.0	175.8	180.0
42.5°	141.6	140.3	143.6	147.0	151.2	155.3	159.5	162.4	167.0	171.6	175.8
45°	133.6	132.8	136.1	140.3	144.9	149.5	153.2	157.4	162.4	167.0	171.6
47.5°	125.7	124.9	128.6	133.2	137.8	142.8	147.4	152.4	157.4	162.4	167.0
50°	117.3	117.3	121.5	126.1	130.7	136.5	141.1	147.0	152.0	157.4	162.0
52.5°	109.8	109.8	114.0	118.6	124.0	129.9	135.7	141.1	147.0	152.0	157.4
55°	101.5	102.3	106.9	111.5	116.9	123.2	129.4	135.3	141.6	147.0	152.0
57.5°	93.5	94.8	99.0	104.0	110.2	116.9	123.2	129.4	135.3	141.1	146.6
60°	85.2	86.9	91.4	96.9	103.1	110.2	116.9	123.2	129.4	135.7	140.7
62.5°	76.8	78.9	83.5	88.9	96.0	103.1	110.2	116.5	123.2	129.0	134.5
65°	68.9	71.0	75.6	81.4	88.9	96.5	103.6	110.2	116.9	122.8	128.6
67.5°	61.0	63.1	68.1	74.3	81.8	89.4	96.5	103.6	110.2	116.1	121.5
70°	51.8	55.1	60.1	66.8	74.7	82.3	89.8	96.5	103.1	109.8	115.2
72.5°	44.3	47.2	52.6	59.7	67.2	75.2	82.7	89.8	96.5	102.7	108.1
75°	35.5	38.8	44.7	52.2	60.1	68.1	75.6	82.7	89.4	95.6	101.5
77.5°	28.0	31.3	37.6	45.1	53.0	61.0	68.9	76.0	82.7	88.9	94.4
80°	20.9	24.2	30.9	38.4	46.8	54.7	62.2	69.3	76.0	82.3	87.7
82.5°	14.2	17.5	24.6	32.2	40.1	48.0	55.5	62.6	69.3	75.6	81.4
85°	7.9	12.1	18.8	26.3	34.2	42.2	49.7	57.2	63.5	69.7	75.6
87.5°	3.3	7.9	14.2	21.3	29.2	37.2	44.7	51.4	58.5	64.3	69.7
90°	0.0	4.2	10.0	17.1	25.1	32.6	40.1	46.8	53.4	59.3	64.7
92.5°	0.0	2.5	7.9	14.6	22.1	29.6	36.7	43.8	50.1	56.0	61.4
95°	0.0	1.3	5.8	12.5	19.2	26.3	33.4	40.1	46.3	52.2	57.2
97.5°	0.0	0.4	4.6	10.0	16.7	23.8	30.5	37.2	43.0	48.4	53.4
100°	0.0	0.0	3.3	8.4	14.6	20.9	27.6	33.8	39.7	44.7	49.7
102.5°	0.0	0.0	1.7	6.7	12.5	18.4	24.6	30.5	36.3	41.3	46.3
105°	0.0	0.0	0.8	5.0	10.4	16.3	22.1	27.6	33.0	38.0	43.0
107.5°	0.0	0.0	0.0	3.3	8.4	13.8	19.6	25.1	30.5	35.1	39.3
110°	0.0	0.0	0.0	2.1	6.7	11.7	17.1	22.1	27.1	31.7	36.3



TEST NUMBER: P231591

CATALOG NUMBER: S121-DR-LO-27-X-0048-1-U-DD-4-W

**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
112.5°	0.0	0.0	0.0	0.8	5.0	9.6	14.6	19.6	24.2	28.8	33.0
115°	0.0	0.0	0.0	0.0	3.3	7.5	12.5	17.1	21.7	25.9	30.1
117.5°	0.0	0.0	0.0	0.0	1.7	5.8	10.0	14.6	18.8	23.0	26.7
120°	0.0	0.0	0.0	0.0	0.4	4.2	7.9	12.5	16.3	20.5	23.8
122.5°	0.0	0.0	0.0	0.0	0.0	2.1	5.8	10.0	13.8	17.5	20.9
125°	0.0	0.0	0.0	0.0	0.0	0.8	4.2	7.5	11.3	14.6	18.4
127.5°	0.0	0.0	0.0	0.0	0.0	0.0	2.1	5.4	8.8	12.1	15.4
130°	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.3	6.7	9.6	12.5
132.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	4.2	7.1	9.6
135°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.1	4.6	7.1
137.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.5	4.6
140°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.5
142.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
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



TEST NUMBER: P231591

CATALOG NUMBER: S121-DR-LO-27-X-0048-1-U-DD-4-W

**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°
0°	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0
2.5°	217.1	217.6	218.0	217.6	217.6	218.0	217.6	217.1
5°	216.3	216.7	217.1	217.1	217.6	217.6	217.1	216.7
7.5°	216.3	217.1	217.6	218.0	218.0	218.4	218.0	217.6
10°	216.3	216.7	217.6	218.0	218.0	218.4	218.0	217.6
12.5°	215.5	216.3	217.1	217.1	217.6	218.0	217.6	217.1
15°	213.8	214.6	215.9	216.3	216.7	216.7	216.3	216.3
17.5°	212.1	213.0	214.2	214.6	215.0	215.5	215.0	215.0
20°	209.6	210.9	212.1	213.0	213.4	213.8	213.8	213.4
22.5°	207.1	208.8	210.0	210.5	211.3	212.1	211.7	211.7
25°	204.2	205.9	207.5	208.4	209.2	210.0	209.6	209.6
27.5°	201.3	202.9	204.6	205.9	207.1	207.5	207.5	207.5
30°	197.5	200.0	201.7	202.9	204.2	205.0	205.0	205.0
32.5°	194.2	196.7	198.8	200.0	201.7	202.5	202.9	202.9
35°	190.8	193.3	195.8	197.5	199.2	200.4	200.4	200.8
37.5°	187.1	190.4	192.9	195.0	196.7	197.9	198.3	197.9
40°	183.7	187.1	189.6	192.1	193.8	195.0	195.4	195.4
42.5°	179.6	183.3	186.2	188.7	190.8	192.1	192.5	192.5
45°	175.8	179.6	182.9	185.4	187.1	188.3	189.2	189.2
47.5°	171.6	175.4	178.3	181.2	183.3	184.6	185.0	185.4
50°	167.0	170.8	173.7	177.0	179.1	180.4	180.8	181.2
52.5°	162.0	165.8	169.5	172.5	174.5	176.2	176.6	176.6
55°	157.0	160.8	164.5	167.4	169.9	171.2	172.0	172.5
57.5°	151.2	155.3	159.1	162.4	164.5	166.2	167.0	167.0
60°	145.7	149.9	153.7	157.0	159.1	160.8	161.2	162.0
62.5°	139.5	143.6	147.8	150.7	152.8	154.5	155.3	155.8
65°	133.2	137.8	142.0	144.5	146.6	148.7	149.5	149.9
67.5°	126.5	131.1	134.9	138.2	139.9	142.0	142.8	142.8
70°	120.3	124.9	128.2	131.1	133.6	135.3	136.1	136.5
72.5°	113.6	117.8	121.5	124.4	126.5	128.2	129.4	129.4
75°	106.1	110.7	114.4	117.3	119.8	121.5	122.3	122.3
77.5°	99.8	104.0	107.3	110.7	113.2	114.8	115.7	116.1
80°	92.7	96.9	100.6	103.6	106.1	107.7	108.6	109.0
82.5°	86.4	90.6	94.0	97.3	99.4	101.1	101.9	102.3
85°	80.2	84.3	88.1	90.6	93.1	94.4	95.6	95.6
87.5°	74.7	78.5	82.3	84.8	87.3	88.9	89.8	89.8
90°	69.3	73.5	76.8	80.2	82.3	83.9	84.3	84.8
92.5°	65.6	69.7	73.1	76.0	78.1	79.3	80.6	80.6
95°	61.8	65.6	69.3	71.8	73.9	75.6	76.4	76.8
97.5°	58.0	61.8	65.1	67.6	69.7	71.4	71.8	72.2
100°	54.3	58.0	61.0	63.5	65.6	66.8	68.1	68.1
102.5°	50.5	54.3	57.2	59.7	61.8	63.1	63.9	63.9
105°	46.8	50.5	53.4	56.0	57.6	59.3	59.7	59.7
107.5°	43.4	47.2	50.1	52.2	53.9	55.5	56.4	56.4
110°	40.1	43.4	46.3	48.4	50.5	51.8	52.6	52.6





TEST NUMBER: P231591

CATALOG NUMBER: S121-DR-LO-27-X-0048-1-U-DD-4-W

**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°
112.5°	36.7	40.1	43.0	45.1	46.8	48.0	48.9	48.9
115°	33.4	36.7	39.3	41.8	43.4	44.7	45.1	45.1
117.5°	30.5	33.4	35.9	38.0	39.7	40.9	41.8	41.8
120°	27.1	30.1	32.6	34.7	36.3	37.2	38.0	38.0
122.5°	24.2	26.7	29.2	31.3	32.6	33.8	34.7	34.2
125°	21.3	23.8	25.9	28.0	29.2	30.5	30.9	30.9
127.5°	18.0	20.5	23.0	24.6	25.9	27.1	27.6	27.6
130°	15.0	17.5	19.6	21.3	22.5	23.4	24.2	24.2
132.5°	12.5	14.6	16.7	18.0	19.2	20.0	20.9	20.9
135°	9.6	11.7	13.4	15.0	16.3	17.1	17.5	18.0
137.5°	6.7	8.8	10.4	12.1	12.9	13.8	14.2	14.2
140°	4.2	5.8	7.5	8.8	9.6	10.4	10.9	11.3
142.5°	1.7	3.3	4.6	5.8	6.7	7.1	7.5	7.5
145°	0.0	0.8	2.1	2.9	3.8	4.6	4.6	5.0
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)