

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: io LED

Report Number: P182662

Luminaire Tested: **LDSQA4A28827D010TE LAR15SP 4LSQA1H-LSF-20 30°**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P182662  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P26830)  
Test Lab: INNOVATION CENTER-P2  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: io LED  
Catalog Number: LDSQA4A28827D010TE LAR15SP 4LSQA1H-LSF-20 30°  
Description: PORTFOLIO 4" SQUARE ADJUSTABLE REFLECTOR, ANGLE-CUT TRIM,  
SELF-FLANGED, 15° SPOT WITH SOLITE LENS, 30° Tilt  
Light Source: (1) HIGH LUMEN LED 80CRI / 2700K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2394.1 lumens  
Efficiency: N/A  
Efficacy: 53.8 lumens/watt  
Spacing Criteria (0/90/45): 2.28 / 0.64 / 1.15  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

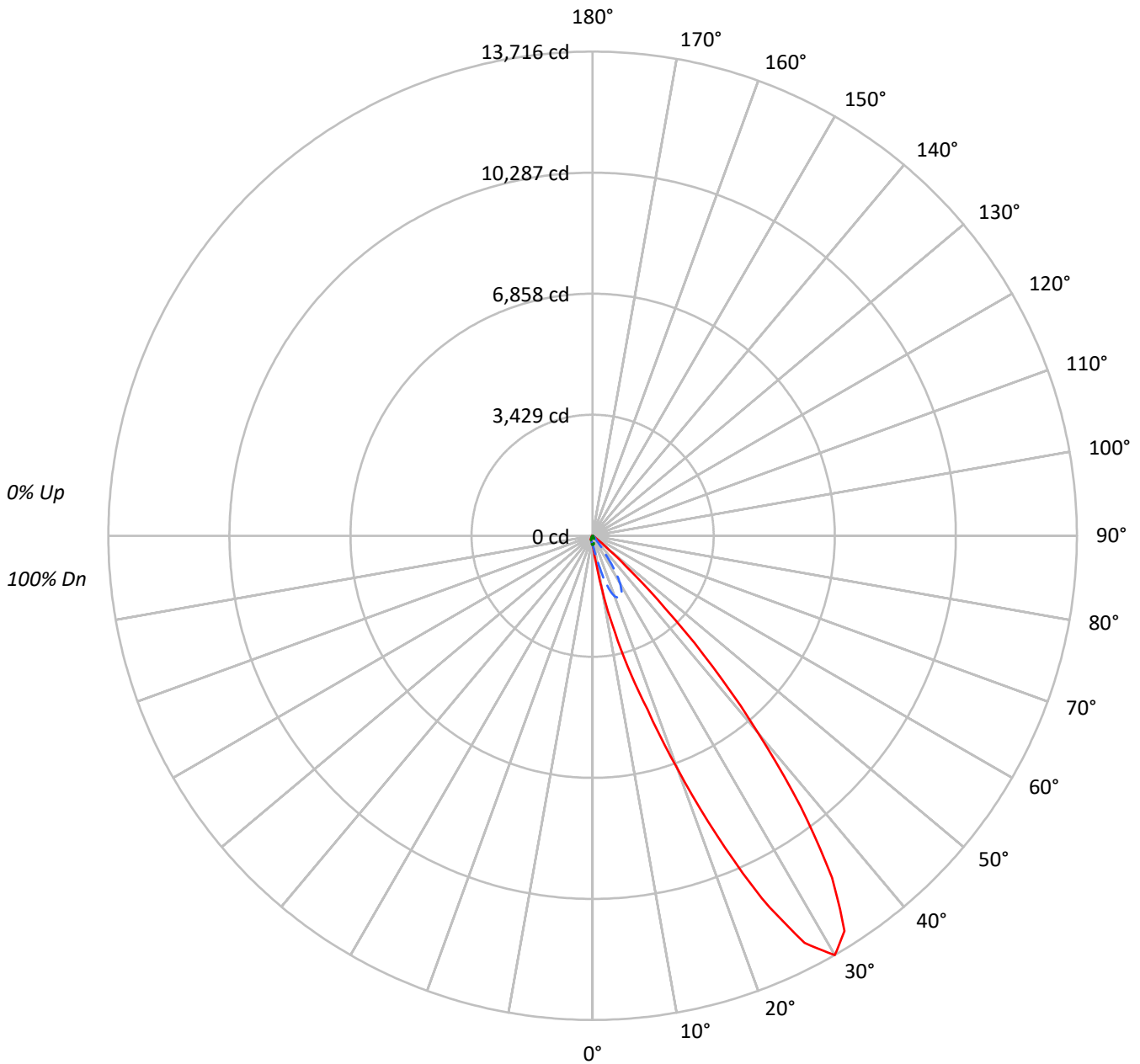
Input Watts (W): 44.49  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	112	109	106	104	110	107	104	102	103	101	99	99	98	96	96	94	93	91					91			
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	84	83					83			
3	99	91	85	81	97	90	84	80	87	83	79	85	81	77	82	79	76	74					74			
4	92	83	77	72	90	82	76	71	80	75	70	78	73	70	76	72	69	67					67			
5	86	76	69	64	85	75	69	64	73	68	63	72	67	63	70	66	62	60					60			
6	81	70	63	58	79	69	62	57	67	61	57	66	61	57	64	60	56	54					54			
7	75	64	57	52	74	63	57	52	62	56	51	61	55	51	59	55	51	49					49			
8	70	59	52	47	69	58	51	47	57	51	46	56	50	46	55	50	46	44					44			
9	66	54	47	42	65	54	47	42	53	46	42	52	46	42	51	46	42	40					40			
10	62	50	43	38	60	50	43	38	49	42	38	48	42	38	47	42	38	36					36			

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

	0°	90°	180°
0°	25033	25033	25033
5°	47952	23845	19362
10°	156802	21140	16467
15°	384011	17451	14542
20°	723535	13320	13052
25°	1211173	9438	11416
30°	1534323	6488	9732
35°	1398047	4210	8267
40°	920731	2997	7006
45°	398842	1987	5782
50°	70744	1387	4762
55°	11350	1115	4003
60°	2809	1027	3061
65°	917	1215	2407
70°	736	1501	1869
75°	973	1497	1497
80°	0	2232	1450
85°	0	4446	1445



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	33.1	1.4
10°-20°	266.3	11.1
20°-30°	802.1	33.5
30°-40°	913.0	38.1
40°-50°	337.6	14.1
50°-60°	26.8	1.1
60°-70°	7.2	0.3
70°-80°	5.0	0.2
80°-90°	2.9	0.1
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°	1101.6	46.0
0°-40°	2014.6	84.1
0°-60°	2378.9	99.4
0°-90°	2394.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2394.1	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	258	258	258	258	258	
5°	493	363	245	206	199	80
15°	3829	1293	174	137	145	1201
25°	11331	1891	88	86	107	5172
35°	11822	662	36	49	70	7028
45°	2911	78	14	26	42	2465
55°	67	14	7	16	24	110
65°	4	4	5	10	10	5
75°	3	4	4	7	4	2
85°	0	3	4	4	1	0
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4
2.5°	332.3	334.9	332.3	327.0	327.0	320.4	317.8	315.1	308.5	304.6	299.3
5°	493.1	485.2	478.6	462.8	457.5	443.0	432.5	418.0	398.2	381.0	362.6
7.5°	843.8	832.0	806.9	759.4	730.4	694.8	667.2	621.0	561.7	512.9	464.1
10°	1594.0	1542.6	1483.3	1376.5	1298.7	1215.6	1149.7	1025.8	876.8	754.2	635.5
12.5°	2568.4	2572.4	2461.6	2281.0	2137.3	1990.9	1877.5	1648.1	1384.4	1153.7	925.6
15°	3828.9	3756.4	3641.6	3364.8	3077.3	2865.1	2684.4	2336.4	1963.2	1625.7	1293.4
17.5°	5156.6	5186.9	4919.3	4467.0	4012.1	3694.4	3421.5	2894.1	2451.1	2033.1	1627.0
20°	7018.3	6810.0	6427.6	5694.5	4987.8	4527.7	4122.9	3438.6	2820.2	2288.9	1832.7
22.5°	9164.8	8828.6	8050.7	7018.3	5949.0	5312.2	4747.9	3806.5	3054.9	2419.4	1902.6
25°	11331.0	11073.9	9834.6	8291.9	6759.9	5934.5	5204.0	4055.7	3167.0	2449.7	1890.7
27.5°	13002.9	12583.6	11171.5	9160.8	7243.7	6269.4	5416.3	4132.1	3143.3	2375.9	1778.6
30°	13716.2	13186.1	11621.1	9358.6	7247.7	6214.0	5310.8	3980.5	2974.5	2188.7	1567.7
32.5°	13275.8	12664.0	11085.8	8811.4	6751.9	5781.5	4903.4	3652.2	2695.0	1894.7	1177.4
35°	11821.5	11212.4	9750.2	7731.6	5960.9	5113.1	4349.7	3223.7	2295.5	1404.2	661.9
37.5°	9680.3	9160.8	8115.3	6480.3	5023.4	4335.2	3699.7	2716.1	1710.1	805.6	332.3
40°	7280.7	6915.4	6287.8	5139.4	4066.2	3542.8	3031.2	2080.6	1039.0	404.8	188.5
42.5°	5047.1	4809.8	4494.7	3802.5	3136.7	2776.7	2366.7	1389.7	534.0	222.8	117.3
45°	2911.2	2762.2	2675.2	2379.9	2120.1	1944.8	1582.2	748.9	270.3	133.2	77.8
47.5°	1285.5	1186.6	1144.4	1020.5	949.3	901.8	715.9	319.1	145.0	85.7	64.6
50°	469.4	469.4	470.7	414.0	338.8	304.6	238.6	141.1	81.7	67.2	47.5
52.5°	166.1	163.5	170.1	160.9	141.1	126.6	105.5	71.2	50.1	42.2	26.4
55°	67.2	64.6	67.2	63.3	59.3	55.4	48.8	38.2	31.6	26.4	14.5
57.5°	30.3	30.3	31.6	30.3	30.3	27.7	25.1	29.0	22.4	14.5	9.2
60°	14.5	14.5	15.8	15.8	15.8	14.5	14.5	15.8	13.2	9.2	6.6
62.5°	6.6	6.6	7.9	7.9	7.9	7.9	7.9	9.2	6.6	5.3	4.0
65°	4.0	2.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
67.5°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	4.0	4.0
70°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	4.0
72.5°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	4.0
75°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	4.0
77.5°	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	2.6	2.6	4.0
80°	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	2.6	2.6	2.6
82.5°	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	2.6	2.6	2.6
85°	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	2.6	2.6
87.5°	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	2.6	2.6
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):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4
2.5°	294.0	290.1	282.2	278.2	272.9	269.0	266.3	261.1	255.8	251.8	249.2
5°	345.4	330.9	313.8	300.6	290.1	283.5	272.9	263.7	253.1	245.2	238.6
7.5°	420.6	385.0	346.8	320.4	305.9	292.7	274.2	258.4	243.9	233.4	224.1
10°	537.9	461.5	394.2	342.8	317.8	299.3	270.3	247.9	229.4	214.9	205.7
12.5°	733.1	576.2	457.5	370.5	332.3	304.6	263.7	233.4	211.0	196.5	184.6
15°	1000.7	744.9	544.5	403.5	349.4	309.8	253.1	216.2	191.2	174.0	163.5
17.5°	1252.6	921.6	643.4	443.0	366.5	312.5	238.6	193.8	167.4	151.6	141.1
20°	1410.8	1036.3	709.3	465.4	371.8	304.6	218.9	170.1	143.7	129.2	118.7
22.5°	1447.7	1049.5	704.1	444.3	349.4	280.8	191.2	146.4	121.3	108.1	98.9
25°	1393.6	975.7	630.2	383.7	298.0	236.0	159.5	118.7	100.2	88.3	81.7
27.5°	1257.8	830.6	498.4	288.7	222.8	174.0	121.3	92.3	80.4	71.2	67.2
30°	1013.9	584.1	312.5	179.3	142.4	114.7	87.0	71.2	62.0	58.0	54.1
32.5°	614.4	300.6	164.8	106.8	89.7	77.8	63.3	52.7	47.5	44.8	43.5
35°	292.7	158.2	101.5	72.5	63.3	55.4	46.1	39.6	36.9	35.6	35.6
37.5°	166.1	102.8	68.6	48.8	43.5	38.2	34.3	30.3	29.0	29.0	29.0
40°	105.5	65.9	44.8	35.6	31.6	29.0	26.4	23.7	23.7	23.7	23.7
42.5°	68.6	47.5	34.3	26.4	23.7	22.4	19.8	18.5	18.5	18.5	19.8
45°	54.1	39.6	27.7	21.1	18.5	17.1	15.8	14.5	14.5	14.5	15.8
47.5°	46.1	27.7	18.5	14.5	11.9	11.9	10.5	10.5	10.5	11.9	13.2
50°	27.7	17.1	11.9	9.2	7.9	7.9	7.9	7.9	7.9	9.2	10.5
52.5°	15.8	10.5	7.9	6.6	5.3	5.3	5.3	5.3	6.6	7.9	7.9
55°	10.5	7.9	5.3	5.3	4.0	4.0	4.0	5.3	5.3	6.6	7.9
57.5°	6.6	5.3	4.0	4.0	4.0	4.0	4.0	4.0	5.3	6.6	6.6
60°	5.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.3	5.3	6.6
62.5°	4.0	4.0	5.3	4.0	4.0	4.0	4.0	4.0	5.3	5.3	6.6
65°	4.0	4.0	5.3	5.3	4.0	4.0	4.0	4.0	4.0	5.3	6.6
67.5°	4.0	4.0	5.3	5.3	5.3	5.3	4.0	4.0	4.0	5.3	5.3
70°	4.0	5.3	5.3	5.3	5.3	5.3	5.3	4.0	4.0	5.3	5.3
72.5°	4.0	5.3	5.3	5.3	5.3	5.3	5.3	4.0	4.0	5.3	5.3
75°	4.0	4.0	5.3	5.3	5.3	5.3	5.3	4.0	4.0	4.0	5.3
77.5°	4.0	4.0	5.3	5.3	5.3	5.3	5.3	4.0	4.0	4.0	5.3
80°	4.0	4.0	4.0	5.3	4.0	5.3	4.0	4.0	4.0	4.0	4.0
82.5°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
85°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
87.5°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
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):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4
2.5°	245.2	242.6	238.6	237.3	238.6	237.3	230.7	229.4	226.8	226.8	226.8
5°	232.1	228.1	222.8	220.2	220.2	217.5	211.0	209.6	205.7	205.7	204.4
7.5°	216.2	211.0	204.4	201.7	201.7	199.1	192.5	189.9	187.2	187.2	185.9
10°	197.8	191.2	184.6	183.3	182.0	178.0	174.0	172.7	168.8	170.1	168.8
12.5°	176.7	171.4	166.1	163.5	163.5	159.5	156.9	155.6	154.3	154.3	154.3
15°	156.9	150.3	145.0	143.7	143.7	142.4	139.8	139.8	137.1	139.8	139.8
17.5°	134.5	129.2	127.9	125.3	126.6	125.3	122.6	123.9	123.9	125.3	126.6
20°	113.4	109.4	108.1	106.8	108.1	108.1	106.8	108.1	109.4	113.4	116.0
22.5°	94.9	92.3	92.3	91.0	92.3	93.6	92.3	94.9	97.6	100.2	104.2
25°	79.1	77.8	77.8	77.8	79.1	80.4	81.7	84.4	85.7	89.7	92.3
27.5°	64.6	64.6	64.6	65.9	67.2	68.6	69.9	73.8	75.2	79.1	81.7
30°	54.1	52.7	54.1	55.4	56.7	59.3	60.7	63.3	64.6	68.6	71.2
32.5°	43.5	44.8	46.1	47.5	48.8	50.1	51.4	54.1	56.7	59.3	62.0
35°	36.9	36.9	38.2	39.6	40.9	43.5	44.8	46.1	48.8	51.4	52.7
37.5°	30.3	31.6	33.0	34.3	35.6	36.9	38.2	39.6	40.9	43.5	46.1
40°	25.1	26.4	27.7	29.0	29.0	31.6	31.6	34.3	35.6	38.2	40.9
42.5°	21.1	22.4	23.7	25.1	25.1	26.4	27.7	29.0	30.3	33.0	35.6
45°	17.1	18.5	19.8	21.1	21.1	22.4	23.7	25.1	26.4	29.0	30.3
47.5°	14.5	15.8	17.1	18.5	18.5	19.8	21.1	22.4	22.4	25.1	26.4
50°	11.9	13.2	14.5	15.8	15.8	17.1	18.5	19.8	19.8	21.1	22.4
52.5°	9.2	10.5	13.2	13.2	14.5	15.8	15.8	17.1	17.1	18.5	19.8
55°	9.2	10.5	11.9	11.9	13.2	14.5	14.5	15.8	15.8	15.8	17.1
57.5°	7.9	9.2	10.5	11.9	11.9	13.2	13.2	13.2	13.2	14.5	14.5
60°	7.9	9.2	9.2	10.5	10.5	11.9	11.9	11.9	11.9	13.2	13.2
62.5°	7.9	7.9	9.2	9.2	10.5	10.5	10.5	11.9	11.9	11.9	11.9
65°	6.6	7.9	9.2	9.2	9.2	10.5	10.5	10.5	10.5	10.5	10.5
67.5°	6.6	7.9	7.9	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
70°	6.6	6.6	7.9	7.9	7.9	9.2	9.2	9.2	7.9	9.2	7.9
72.5°	5.3	6.6	6.6	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
75°	5.3	6.6	6.6	6.6	6.6	7.9	7.9	6.6	6.6	6.6	6.6
77.5°	5.3	5.3	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	5.3
80°	5.3	5.3	5.3	5.3	6.6	6.6	5.3	5.3	5.3	5.3	5.3
82.5°	4.0	5.3	5.3	5.3	5.3	5.3	5.3	5.3	4.0	4.0	4.0
85°	4.0	4.0	5.3	5.3	5.3	5.3	4.0	4.0	4.0	4.0	2.6
87.5°	4.0	4.0	4.0	5.3	4.0	4.0	4.0	4.0	2.6	2.6	2.6
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: P182662

CATALOG NUMBER: LDSQA4A28827D010TE LAR15SP 4LSQA1H-LSF-20 30°

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	258.4	258.4	258.4	258.4	258.4	258.4	258.4	258.4
2.5°	222.8	221.5	222.8	221.5	221.5	222.8	218.9	221.5
5°	201.7	199.1	200.4	199.1	197.8	199.1	196.5	199.1
7.5°	183.3	182.0	182.0	182.0	180.6	182.0	179.3	182.0
10°	167.4	166.1	166.1	166.1	166.1	167.4	164.8	167.4
12.5°	151.6	151.6	152.9	151.6	152.9	154.3	151.6	154.3
15°	138.4	139.8	141.1	141.1	142.4	143.7	142.4	145.0
17.5°	127.9	129.2	131.8	131.8	133.2	135.8	134.5	137.1
20°	117.3	118.7	121.3	121.3	122.6	125.3	123.9	126.6
22.5°	105.5	108.1	109.4	110.8	112.1	114.7	113.4	116.0
25°	93.6	97.6	98.9	100.2	101.5	104.2	104.2	106.8
27.5°	84.4	87.0	88.3	89.7	92.3	94.9	94.9	96.2
30°	73.8	76.5	79.1	80.4	81.7	84.4	84.4	87.0
32.5°	64.6	67.2	68.6	69.9	72.5	75.2	76.5	77.8
35°	55.4	59.3	60.7	63.3	64.6	68.6	68.6	69.9
37.5°	48.8	51.4	54.1	55.4	58.0	60.7	60.7	63.3
40°	43.5	46.1	47.5	48.8	51.4	54.1	54.1	55.4
42.5°	36.9	40.9	42.2	43.5	44.8	47.5	48.8	50.1
45°	33.0	34.3	35.6	36.9	38.2	40.9	40.9	42.2
47.5°	27.7	29.0	30.3	31.6	33.0	34.3	35.6	36.9
50°	23.7	25.1	26.4	26.4	27.7	30.3	30.3	31.6
52.5°	19.8	21.1	22.4	22.4	23.7	26.4	26.4	27.7
55°	17.1	18.5	19.8	19.8	21.1	22.4	22.4	23.7
57.5°	15.8	15.8	17.1	17.1	18.5	18.5	19.8	19.8
60°	13.2	14.5	14.5	14.5	15.8	15.8	15.8	15.8
62.5°	11.9	11.9	11.9	11.9	11.9	11.9	11.9	13.2
65°	10.5	10.5	10.5	10.5	10.5	10.5	9.2	10.5
67.5°	9.2	9.2	9.2	9.2	7.9	7.9	7.9	7.9
70°	7.9	7.9	7.9	7.9	7.9	6.6	6.6	6.6
72.5°	6.6	6.6	6.6	6.6	6.6	5.3	5.3	5.3
75°	6.6	6.6	5.3	5.3	5.3	5.3	5.3	4.0
77.5°	5.3	5.3	5.3	5.3	4.0	4.0	4.0	4.0
80°	4.0	4.0	4.0	4.0	4.0	4.0	2.6	2.6
82.5°	4.0	2.6	2.6	2.6	2.6	2.6	2.6	2.6
85°	2.6	2.6	2.6	2.6	1.3	1.3	1.3	1.3
87.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Report Generated By E9808895 / USPTCWHP6082093





— 0°-180°    - - 45°-225°    - - - - 90°-270°















(END OF REPORT)