

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: P170931

Luminaire Tested: **LDA4A28935D010TE LAR15SP 4LA1 30° Tilt**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P170931
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P25648)
Test Lab: INNOVATION CENTER-P2
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: io LED
Catalog Number: LDA4A28935D010TE LAR15SP 4LA1 30° Tilt
Description: PORTFOLIO 4" Adjustable Reflector, Self-flanged Trim Ring, 15° Spot Optic, at 30° tilt
Light Source: (1) HIGH LUMEN LED 90CRI / 3500K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 2067.7 lumens
Efficiency: N/A
Efficacy: 46.5 lumens/watt
Spacing Criteria (0/90/45): 2.52 / 1.04 / 1.28
Luminous Opening: Circular (Dia: 0.33' x H: 0')
CIE Type: Direct

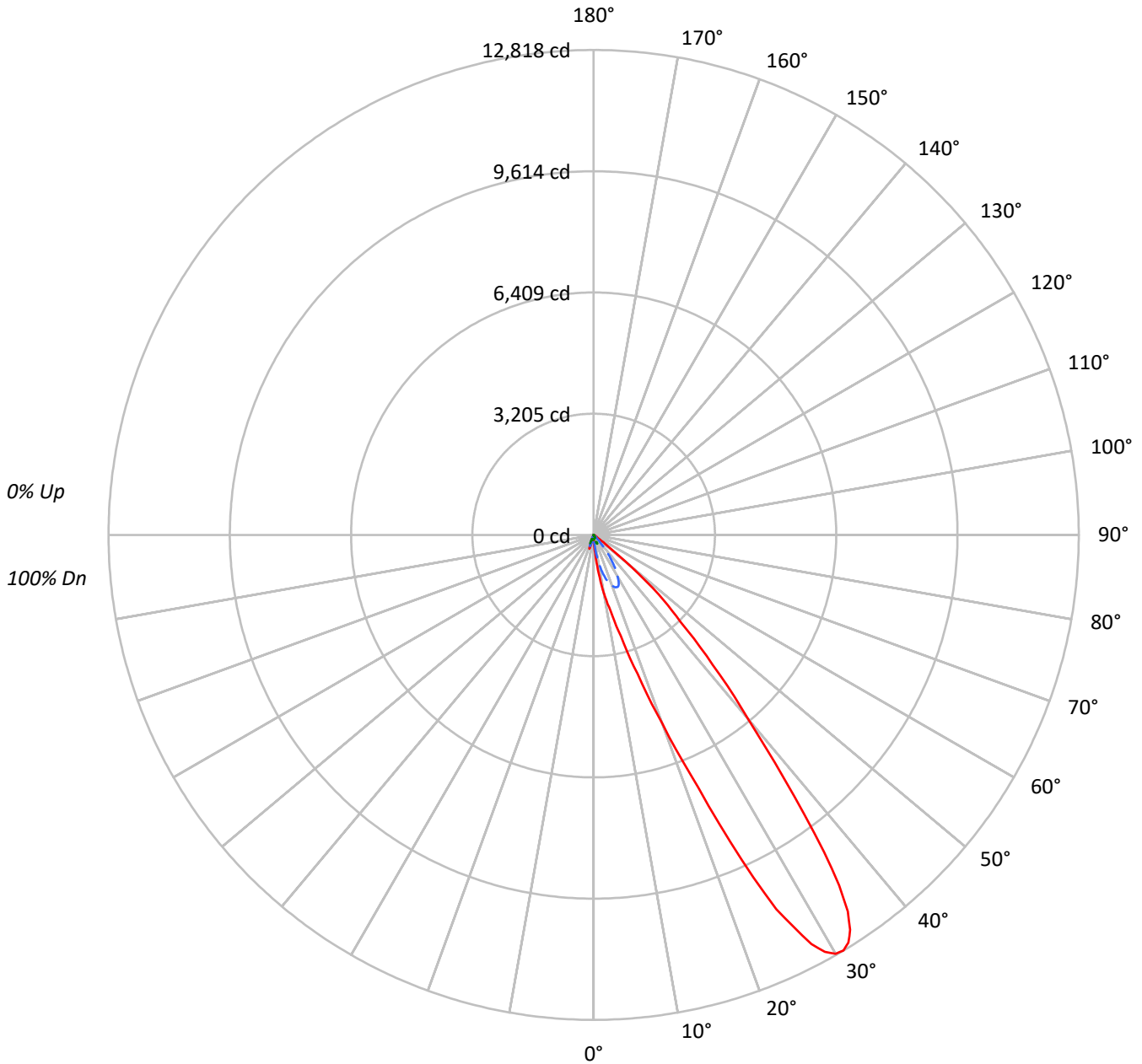
Input Watts (W): 44.49
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	86	84	82					82			
3	99	91	85	80	97	90	84	80	87	82	78	84	80	77	82	79	76	74					74			
4	92	83	77	71	90	82	76	71	80	74	70	78	73	69	76	72	68	67					67			
5	86	76	69	64	84	75	68	63	73	67	63	71	66	62	70	65	62	60					60			
6	80	69	62	57	79	69	62	57	67	61	56	65	60	56	64	59	56	54					54			
7	75	64	56	51	73	63	56	51	62	55	51	60	55	50	59	54	50	49					49			
8	70	58	51	46	69	58	51	46	57	50	46	55	50	46	54	49	45	44					44			
9	65	54	47	42	64	53	46	42	52	46	41	51	45	41	50	45	41	40					40			
10	61	49	42	38	60	49	42	38	48	42	38	47	41	37	46	41	37	36					36			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	14875	14875	14875
5°	66737	13979	9051
10°	197542	12863	11573
15°	352660	15234	32614
20°	698548	29980	35034
25°	1359322	19557	9949
30°	1820819	7307	3475
35°	1703766	3087	1355
40°	1020972	1449	419
45°	566572	890	0
50°	207838	729	0
55°	31741	559	0
60°	6957	641	0
65°	2247	759	0
70°	469	938	0
75°	0	1811	0
80°	0	2699	0
85°	0	5378	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	26.5	1.3
10°-20°	223.4	10.8
20°-30°	666.7	32.2
30°-40°	789.6	38.2
40°-50°	327.6	15.8
50°-60°	25.5	1.2
60°-70°	3.5	0.2
70°-80°	2.7	0.1
80°-90°	2.4	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°	916.6	44.3
0°-40°	1706.1	82.5
0°-60°	2059.2	99.6
0°-90°	2067.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	2067.7	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	121	121	121	121	121	
5°	539	272	113	78	73	85
15°	2762	1166	119	178	255	912
25°	9988	1516	144	83	73	4562
35°	11315	844	20	12	9	6557
45°	3248	74	5	4	0	2648
55°	148	10	3	1	0	216
65°	8	3	3	3	0	10
75°	0	3	4	3	0	0
85°	0	3	4	3	0	0
90°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	2.5°	5°	7.5°	10°	12.5°	15°	17.5°	20°	22.5°	25°
0°	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6
2.5°	209.2	198.9	204.0	195.1	200.2	191.2	184.8	191.2	191.2	186.1	178.4
5°	539.0	536.4	546.7	522.3	528.7	501.8	478.7	485.1	480.0	463.3	433.8
7.5°	1026.6	1016.4	1027.9	993.3	994.6	949.6	915.0	922.7	899.6	871.4	820.0
10°	1577.2	1563.1	1575.9	1534.8	1527.1	1464.2	1415.5	1423.2	1370.6	1324.4	1246.1
12.5°	2054.6	2053.3	2012.2	2019.9	2004.5	1908.3	1877.5	1880.0	1808.2	1756.8	1663.2
15°	2761.7	2788.6	2796.3	2743.7	2648.7	2474.2	2397.2	2367.7	2250.9	2164.9	2030.2
17.5°	3848.6	3885.8	3758.8	3789.6	3633.0	3359.7	3207.0	3115.9	2896.4	2734.7	2490.9
20°	5321.8	5289.8	5106.3	5083.2	4816.2	4464.6	4143.8	3971.8	3634.3	3398.2	3042.7
22.5°	7223.7	7199.3	6884.9	6745.0	6186.8	5691.4	5275.6	4844.5	4342.7	4027.0	3544.5
25°	9987.9	9876.3	9270.6	8872.7	7891.0	7049.2	6356.2	5686.3	4917.6	4575.0	3961.5
26°	11005.6	10978.6	10347.3	9823.7	8640.5	7595.9	6661.6	5990.4	5143.5	4743.1	4079.6
27°	11616.4	11830.7	11243.0	10650.1	9356.5	8105.3	7022.2	6235.6	5319.3	4861.1	4155.3
28°	12250.4	12389.0	11862.8	11118.5	9930.2	8510.8	7295.6	6401.1	5427.1	4918.9	4181.0
29°	12599.4	12732.9	12244.0	11545.9	10306.2	8773.9	7457.3	6474.3	5466.9	4917.6	4157.9
30°	12784.2	12908.7	12431.3	11753.7	10461.5	8856.1	7491.9	6444.7	5428.4	4858.6	4092.4
31°	12817.6	12921.6	12450.6	11747.3	10402.4	8754.7	7394.4	6322.8	5325.7	4749.5	3993.6
32°	12704.7	12785.5	12306.9	11557.4	10136.8	8498.0	7191.6	6134.2	5169.1	4613.5	3866.6
33°	12440.3	12585.3	12001.4	11173.7	9674.8	8118.2	6904.2	5887.8	4974.1	4436.4	3711.3
34°	12002.7	12095.1	11490.7	10573.1	9058.8	7656.2	6551.2	5601.6	4750.8	4227.2	3535.5
35°	11314.9	11397.0	10728.4	9762.1	8356.9	7135.2	6148.3	5285.9	4500.5	3992.3	3340.4
36°	10362.7	10440.9	9741.5	8861.2	7648.5	6592.3	5723.5	4942.0	4229.8	3740.8	3133.8
37°	9250.0	9318.0	8695.6	7977.0	6952.9	6043.1	5293.6	4592.9	3943.6	3484.2	2937.5
38°	8174.6	8236.2	7733.2	7148.0	6281.8	5506.6	4865.0	4231.0	3648.4	3226.2	2730.9
39°	7204.4	7258.3	6852.8	6370.3	5642.7	4992.0	4437.7	3871.7	3352.0	2968.3	2517.8
40°	6340.8	6387.0	6053.3	5656.8	5062.6	4510.8	4021.9	3523.9	3062.0	2718.0	2318.9
42.5°	4654.5	4664.8	4465.9	4232.3	3770.3	3453.4	3105.6	2746.3	2408.8	2172.6	1918.5
45°	3248.0	3375.1	3245.5	3090.2	2759.1	2560.2	2338.2	2121.3	1926.2	1699.1	1447.6
47.5°	2335.6	2340.7	2263.7	2166.2	1904.4	1768.4	1586.2	1323.1	1129.3	807.2	599.3
50°	1083.1	1022.8	1026.6	959.9	856.0	680.1	568.5	405.5	323.4	231.0	186.1
51°	644.2	599.3	605.7	558.2	488.9	381.1	323.4	259.2	224.6	174.5	143.7
52°	376.0	360.6	359.3	337.5	287.5	264.4	233.6	195.1	170.7	134.7	111.6
53°	273.3	263.1	263.1	249.0	214.3	198.9	177.1	150.1	130.9	102.7	84.7
54°	204.0	196.3	196.3	187.4	173.2	148.9	133.5	111.6	97.5	79.6	62.9
55°	147.6	142.4	142.4	136.0	125.8	107.8	96.2	80.8	71.9	57.7	46.2
57.5°	61.6	59.0	59.0	56.5	53.9	46.2	43.6	37.2	32.1	28.2	23.1
60°	28.2	26.9	28.2	26.9	24.4	25.7	21.8	19.2	18.0	15.4	12.8
61°	21.8	20.5	20.5	20.5	18.0	18.0	16.7	15.4	14.1	11.5	10.3
62°	16.7	15.4	15.4	15.4	14.1	14.1	12.8	11.5	11.5	9.0	7.7
63°	12.8	11.5	11.5	11.5	10.3	10.3	10.3	9.0	9.0	7.7	6.4
64°	9.0	9.0	9.0	9.0	9.0	7.7	7.7	7.7	6.4	5.1	5.1
65°	7.7	6.4	7.7	6.4	6.4	6.4	6.4	6.4	5.1	3.8	3.8
66°	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	3.8	2.6



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CANDELA DISTRIBUTION (continued):

	0°	2.5°	5°	7.5°	10°	12.5°	15°	17.5°	20°	22.5°	25°
72.5°	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3
75°	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3
80°	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3
85°	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.3	1.3	1.3	1.3
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0



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CANDELA DISTRIBUTION (continued):

	27.5°	30°	32.5°	35°	37.5°	40°	42.5°	45°	67.5°	90°	112.5°
0°	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6	120.6
2.5°	174.5	179.7	175.8	165.5	170.7	168.1	163.0	159.1	136.0	118.1	100.1
5°	411.9	415.8	394.0	355.5	342.6	322.1	292.6	272.1	154.0	112.9	88.5
7.5°	779.0	753.3	732.8	660.9	630.1	582.6	526.2	486.4	175.8	106.5	82.1
10°	1179.4	1138.3	1095.9	990.7	935.5	862.4	781.5	735.3	198.9	102.7	82.1
12.5°	1575.9	1520.7	1443.7	1328.2	1249.9	1151.1	1040.8	958.6	215.6	105.2	95.0
15°	1919.8	1853.1	1768.4	1637.5	1546.4	1423.2	1279.5	1166.5	223.3	119.3	132.2
17.5°	2294.5	2173.9	2034.0	1867.2	1767.1	1624.7	1463.0	1325.6	223.3	151.4	211.7
20°	2725.7	2505.0	2280.4	2046.9	1905.7	1756.8	1583.6	1436.0	232.3	228.4	291.3
22.5°	3127.4	2823.3	2506.3	2202.1	2005.8	1844.1	1668.3	1498.9	269.5	251.5	193.8
25°	3439.2	3053.0	2679.5	2309.9	2087.9	1908.3	1719.6	1515.6	246.4	143.7	105.2
26°	3520.1	3103.0	2714.2	2322.8	2091.8	1907.0	1714.5	1497.6	206.6	114.2	84.7
27°	3562.4	3119.7	2716.7	2311.2	2076.4	1885.2	1686.3	1460.4	165.5	92.4	69.3
28°	3562.4	3100.5	2689.8	2279.1	2036.6	1844.1	1637.5	1401.4	134.7	75.7	55.2
29°	3526.5	3050.4	2635.9	2230.4	1982.7	1786.4	1570.8	1332.1	114.2	62.9	44.9
30°	3457.2	2977.3	2564.0	2167.5	1913.4	1720.9	1497.6	1260.2	98.8	51.3	35.9
31°	3359.7	2895.1	2475.5	2099.5	1849.2	1660.6	1430.9	1187.1	86.0	41.1	29.5
32°	3242.9	2792.5	2384.4	2028.9	1796.6	1604.1	1361.6	1110.1	74.4	34.6	25.7
33°	3108.2	2677.0	2289.4	1959.6	1745.3	1540.0	1285.9	1026.6	64.2	28.2	21.8
34°	2959.3	2549.9	2191.9	1885.2	1682.4	1459.1	1197.3	938.1	55.2	24.4	18.0
35°	2797.6	2407.5	2091.8	1809.5	1611.8	1369.3	1102.4	844.4	47.5	20.5	15.4
36°	2623.1	2274.0	1994.2	1733.7	1524.6	1271.8	998.4	748.2	41.1	16.7	14.1
37°	2448.5	2148.2	1898.0	1652.9	1423.2	1161.4	889.3	648.1	35.9	14.1	11.5
38°	2283.0	2026.3	1803.0	1559.2	1305.1	1039.5	776.4	548.0	30.8	12.8	10.3
39°	2127.7	1908.3	1705.5	1447.6	1183.2	921.4	667.3	444.0	26.9	11.5	9.0
40°	1987.8	1796.6	1599.0	1323.1	1057.4	800.8	557.0	331.1	23.1	9.0	7.7
42.5°	1692.7	1489.9	1229.4	922.7	714.8	464.6	259.2	123.2	16.7	6.4	6.4
45°	1117.8	859.8	583.9	347.8	234.8	141.2	105.2	74.4	12.8	5.1	5.1
47.5°	373.4	237.4	173.2	124.5	106.5	84.7	68.0	46.2	9.0	3.8	3.8
50°	142.4	115.5	95.0	71.9	64.2	51.3	41.1	26.9	6.4	3.8	3.8
51°	111.6	91.1	74.4	56.5	51.3	41.1	33.4	23.1	5.1	3.8	3.8
52°	86.0	70.6	57.7	43.6	41.1	33.4	28.2	19.2	5.1	2.6	3.8
53°	65.4	53.9	43.6	33.4	32.1	26.9	23.1	15.4	3.8	2.6	3.8
54°	48.8	41.1	34.6	26.9	26.9	23.1	19.2	12.8	3.8	2.6	3.8
55°	37.2	30.8	26.9	20.5	21.8	19.2	16.7	10.3	3.8	2.6	3.8
57.5°	19.2	18.0	15.4	12.8	14.1	12.8	11.5	6.4	3.8	2.6	3.8
60°	11.5	10.3	9.0	7.7	9.0	9.0	9.0	3.8	3.8	2.6	3.8
61°	9.0	7.7	6.4	6.4	7.7	7.7	7.7	3.8	3.8	2.6	3.8
62°	6.4	6.4	5.1	5.1	7.7	6.4	6.4	3.8	3.8	2.6	3.8
63°	5.1	5.1	5.1	3.8	6.4	6.4	6.4	3.8	3.8	2.6	3.8
64°	3.8	3.8	3.8	3.8	5.1	6.4	6.4	2.6	3.8	2.6	3.8
65°	3.8	3.8	2.6	2.6	5.1	5.1	5.1	2.6	3.8	2.6	3.8
66°	2.6	2.6	2.6	2.6	5.1	5.1	5.1	2.6	3.8	2.6	3.8



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CANDELA DISTRIBUTION (continued):

	27.5°	30°	32.5°	35°	37.5°	40°	42.5°	45°	67.5°	90°	112.5°
72.5°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	3.8
75°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	3.8
77.5°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	5.1
80°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	5.1
82.5°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	5.1
85°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	5.1
87.5°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	3.8	3.8
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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CATALOG NUMBER: LDA4A28935D010TE LAR15SP 4LA1 30° Tilt

CANDELA DISTRIBUTION (continued):

	135°	157.5°	180°
0°	120.6	120.6	120.6
2.5°	91.1	87.3	84.7
5°	78.3	74.4	73.1
7.5°	73.1	71.9	73.1
10°	80.8	86.0	92.4
12.5°	107.8	127.0	137.3
15°	178.4	232.3	255.4
17.5°	314.4	358.0	383.7
20°	277.2	252.8	266.9
22.5°	150.1	130.9	134.7
25°	83.4	71.9	73.1
26°	66.7	57.7	57.7
27°	53.9	46.2	46.2
28°	43.6	37.2	37.2
29°	34.6	29.5	29.5
30°	28.2	24.4	24.4
31°	23.1	19.2	19.2
32°	19.2	16.7	15.4
33°	16.7	14.1	12.8
34°	14.1	11.5	10.3
35°	11.5	9.0	9.0
36°	10.3	7.7	7.7
37°	9.0	6.4	6.4
38°	7.7	5.1	5.1
39°	6.4	5.1	3.8
40°	5.1	3.8	2.6
42.5°	3.8	2.6	1.3
45°	3.8	1.3	0.0
47.5°	2.6	1.3	0.0
50°	2.6	0.0	0.0
51°	2.6	0.0	0.0
52°	2.6	0.0	0.0
53°	1.3	0.0	0.0
54°	2.6	0.0	0.0
55°	1.3	0.0	0.0
57.5°	2.6	0.0	0.0
60°	2.6	0.0	0.0
61°	2.6	0.0	0.0
62°	2.6	0.0	0.0
63°	2.6	0.0	0.0
64°	2.6	1.3	0.0
65°	2.6	1.3	0.0
66°	2.6	1.3	0.0



TEST NUMBER: P170931

CATALOG NUMBER: LDA4A28935D010TE LAR15SP 4LA1 30° Tilt

CANDELA DISTRIBUTION (continued):

	135°	157.5°	180°
72.5°	2.6	1.3	0.0
75°	2.6	1.3	0.0
77.5°	2.6	1.3	0.0
80°	2.6	1.3	0.0
82.5°	2.6	1.3	0.0
85°	2.6	1.3	0.0
87.5°	2.6	1.3	0.0
90°	0.0	0.0	0.0



Report Generated By E9808895 / USPTCWHP6082093





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







67.5°	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	2.6	2.6
70°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	2.6	2.6	1.3	1.3





67.5°	2.6	1.3	2.6	2.6	3.8	5.1	5.1	2.6	3.8	2.6	3.8
70°	1.3	1.3	1.3	1.3	3.8	3.8	5.1	2.6	3.8	2.6	3.8





67.5°	2.6	1.3	0.0
70°	2.6	1.3	0.0



(END OF REPORT)