

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: HALO

Report Number: P300535

Luminaire Tested: **ML4D09_27D2WE - TIR50WFL55 - TL45R6GMWWB - TL46S6GMWWB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P300535
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-1902-156-49)
Test Lab: INNOVATION CENTER(G1)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_27D2WE - TIR50WFL55 - TL45R6GMWWB - TL46S6GMWWB
Description: ML4 2700K, 900LM DIM-TO-WARM, 55 DEG WFL OPTIC, WITH ROUND/SQUARE ASYMM WW, LINEAR SPREAD LENS, MATTE WHITE FLANGE, WHITE LENS FRAME
Light Source: (1) HIGH LUMEN LED 90CRI / 2700K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 446.0 lumens
Efficiency: N/A
Efficacy: 39.8 lumens/watt
Spacing Criteria (0/90/45): 0.7 / 0.72 / 0.74
Luminous Opening: Circular (Dia: 0.19' x H: 0')
CIE Type: Direct

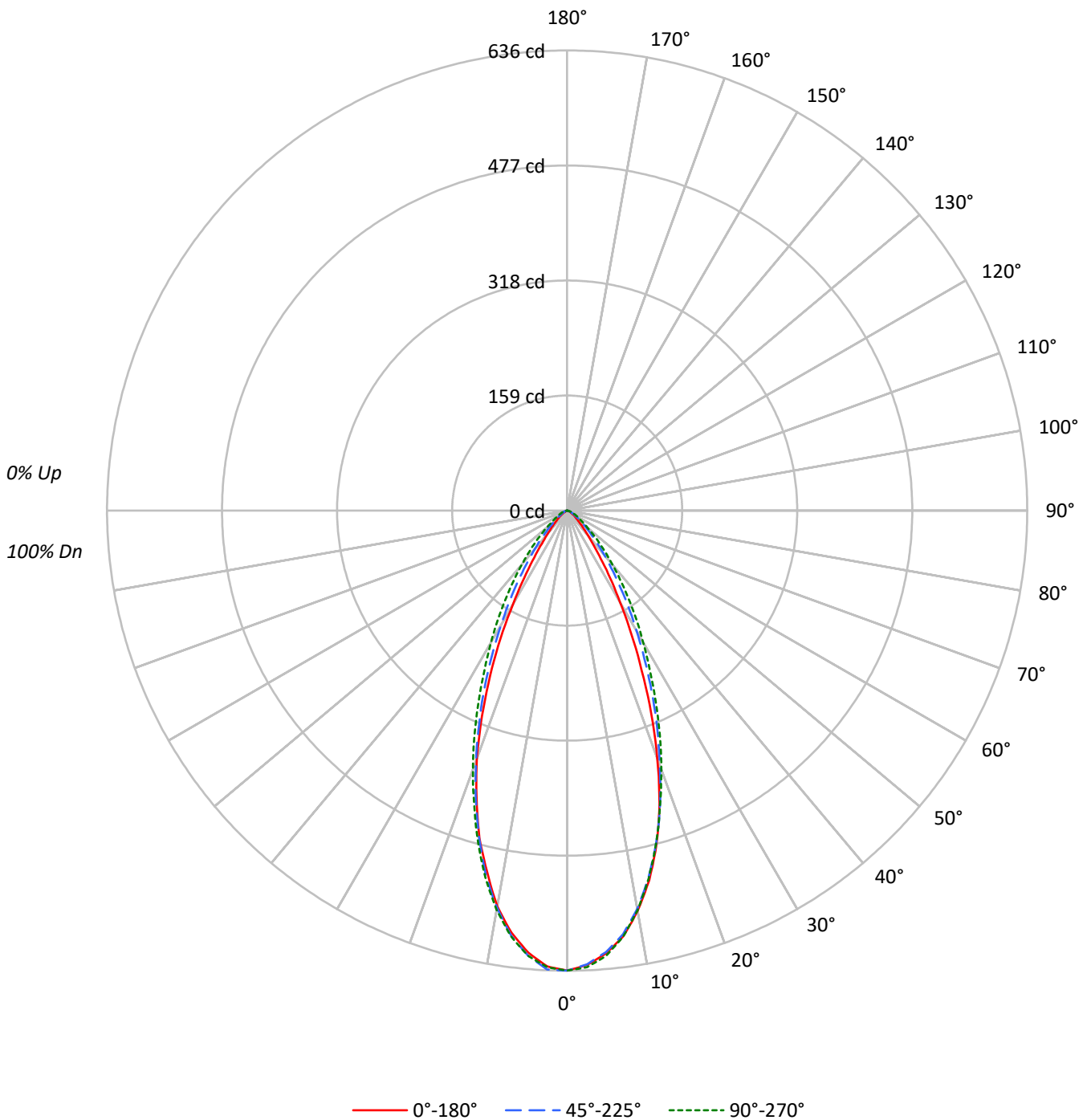
Input Watts (W): 11.2
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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CATALOG NUMBER: ML4D09_27D2WE - TIR50WFL55 - TL45R6GMWWB - TL46S6GMWWB

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	113	110	108	105	111	108	106	104	104	102	101	100	99	98	97	96	95					93				
2	107	102	98	95	105	101	97	94	97	94	92	94	92	90	92	90	88					86				
3	102	95	90	86	100	94	89	85	91	87	84	89	85	83	87	84	81					80				
4	97	89	83	79	95	88	83	78	86	81	78	84	80	77	82	78	76					74				
5	92	83	77	73	90	82	77	73	80	76	72	79	75	71	77	74	71					69				
6	87	78	72	68	86	77	72	68	76	71	67	74	70	67	73	69	66					65				
7	83	74	68	63	82	73	67	63	72	67	63	70	66	62	69	65	62					61				
8	79	70	64	59	78	69	63	59	68	63	59	67	62	59	66	62	58					57				
9	75	66	60	56	74	65	60	56	64	59	56	63	59	55	63	58	55					54				
10	72	62	57	53	71	62	56	53	61	56	53	60	56	52	60	55	52					51				

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	247816	247816	247816
5°	240506	241680	240115
10°	222307	221911	219932
15°	192711	191904	189079
20°	151172	157809	151172
25°	104608	124007	108092
30°	65765	94619	67161
35°	38595	70052	37643
40°	22900	49413	20864
45°	14334	34236	13231
50°	9704	22439	8491
55°	7476	14952	5437
60°	5458	11695	3898
65°	4612	9224	2767
70°	3419	7979	2280
75°	1506	4519	3012
80°	2245	4490	2245
85°	0	4473	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	57.0	12.8
10°-20°	130.7	29.3
20°-30°	124.1	27.8
30°-40°	74.7	16.8
40°-50°	34.7	7.8
50°-60°	14.7	3.3
60°-70°	6.8	1.5
70°-80°	2.6	0.6
80°-90°	0.6	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°	311.8	69.9
0°-40°	386.5	86.7
0°-60°	435.9	97.7
0°-90°	446.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	446.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	636	636	636	636	636	
5°	615	613	618	618	614	57
15°	478	476	476	470	468	131
25°	243	276	288	270	251	112
35°	81	125	147	116	79	53
45°	26	48	62	40	24	21
55°	11	17	22	13	8	10
65°	5	7	10	5	3	5
75°	1	2	3	2	2	2
85°	0	0	1	1	0	0
90°	0	0	0	0	0	



TEST NUMBER: P300535

CATALOG NUMBER: ML4D09_27D2WE - TIR50WFL55 - TL45R6GMWWB - TL46S6GMWWB

CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7
2.5°	628.6	630.6	627.6	625.6	631.6	625.6	631.6	626.6	631.6	625.6	627.6
5°	614.6	615.6	613.6	611.6	618.6	611.6	617.6	613.6	618.6	611.6	612.6
7.5°	593.6	592.6	593.6	589.6	595.6	589.6	594.6	591.6	595.6	588.6	590.6
10°	561.6	563.6	562.6	559.6	565.6	559.6	563.6	559.6	563.6	557.6	558.6
12.5°	523.5	523.5	525.5	520.5	526.5	521.5	522.5	522.5	526.5	516.5	519.5
15°	477.5	475.5	477.5	473.5	478.5	474.5	477.5	475.5	479.5	473.5	475.5
17.5°	424.4	420.4	424.4	419.4	423.4	422.4	425.4	424.4	428.4	423.4	427.4
20°	364.4	363.4	365.4	362.4	369.4	366.4	369.4	369.4	375.4	373.4	374.4
22.5°	304.3	302.3	305.3	304.3	312.3	310.3	313.3	317.3	321.3	321.3	325.3
25°	243.2	244.3	250.3	250.3	255.3	256.3	260.3	264.3	272.3	271.3	276.3
27.5°	192.2	192.2	197.2	196.2	204.2	205.2	209.2	215.2	222.2	227.2	231.2
30°	146.1	147.2	150.2	152.2	160.2	163.2	166.2	173.2	180.2	184.2	191.2
32.5°	110.1	110.1	114.1	115.1	123.1	125.1	129.1	136.1	145.1	150.2	157.2
35°	81.1	81.1	84.1	86.1	93.1	95.1	98.1	105.1	112.1	120.1	125.1
37.5°	59.1	60.1	62.1	64.1	70.1	71.1	74.1	80.1	87.1	93.1	100.1
40°	45.0	45.0	46.0	48.0	52.1	54.1	56.1	61.1	68.1	73.1	79.1
42.5°	34.0	34.0	35.0	37.0	39.0	40.0	42.0	47.0	51.1	56.1	62.1
45°	26.0	26.0	28.0	28.0	30.0	31.0	32.0	36.0	39.0	43.0	48.0
47.5°	20.0	20.0	21.0	22.0	24.0	25.0	25.0	28.0	31.0	34.0	37.0
50°	16.0	16.0	17.0	18.0	19.0	19.0	20.0	22.0	24.0	26.0	28.0
52.5°	13.0	13.0	14.0	14.0	15.0	16.0	16.0	17.0	19.0	20.0	22.0
55°	11.0	11.0	11.0	12.0	12.0	13.0	13.0	14.0	15.0	16.0	17.0
57.5°	9.0	9.0	9.0	9.0	10.0	10.0	11.0	11.0	12.0	13.0	14.0
60°	7.0	7.0	8.0	8.0	8.0	8.0	8.0	9.0	9.0	10.0	11.0
62.5°	6.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	8.0	8.0	9.0
65°	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	7.0	7.0
67.5°	4.0	3.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	6.0
70°	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0
72.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0
75°	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0
80°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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):

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°	95°
0°	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7
2.5°	637.7	639.7	639.7	637.7	635.7	629.6	632.6	625.6	622.6	631.6	632.6
5°	623.6	625.6	623.6	623.6	621.6	615.6	619.6	609.6	608.6	617.6	618.6
7.5°	599.6	601.6	600.6	599.6	597.6	592.6	597.6	585.6	585.6	593.6	594.6
10°	569.6	568.6	566.6	566.6	567.6	561.6	565.6	553.6	553.6	560.6	563.6
12.5°	529.5	528.5	527.5	527.5	528.5	522.5	527.5	513.5	516.5	520.5	524.5
15°	483.5	482.5	481.5	484.5	483.5	479.5	483.5	471.5	475.5	475.5	481.5
17.5°	434.4	435.4	432.4	434.4	434.4	432.4	435.4	422.4	426.4	427.4	433.4
20°	382.4	383.4	385.4	385.4	386.4	384.4	385.4	376.4	381.4	380.4	385.4
22.5°	332.3	336.3	333.3	338.3	340.3	336.3	338.3	329.3	334.3	334.3	337.3
25°	284.3	288.3	289.3	292.3	294.3	293.3	296.3	287.3	289.3	288.3	293.3
27.5°	240.2	244.3	246.3	250.3	252.3	249.3	254.3	245.3	250.3	246.3	250.3
30°	200.2	204.2	207.2	210.2	211.2	212.2	215.2	208.2	213.2	210.2	212.2
32.5°	164.2	169.2	174.2	176.2	179.2	176.2	179.2	175.2	179.2	177.2	177.2
35°	133.1	138.1	141.1	145.1	147.2	147.2	150.2	146.1	148.2	147.2	148.2
37.5°	107.1	111.1	115.1	119.1	121.1	120.1	122.1	121.1	122.1	120.1	120.1
40°	84.1	89.1	93.1	95.1	97.1	97.1	99.1	97.1	100.1	97.1	98.1
42.5°	66.1	71.1	73.1	75.1	77.1	77.1	79.1	78.1	79.1	78.1	78.1
45°	52.1	55.1	57.1	60.1	61.1	61.1	62.1	62.1	63.1	62.1	62.1
47.5°	40.0	42.0	45.0	47.0	48.0	48.0	49.1	48.0	50.1	48.0	48.0
50°	31.0	33.0	34.0	36.0	37.0	37.0	37.0	37.0	38.0	37.0	37.0
52.5°	24.0	25.0	26.0	27.0	28.0	28.0	28.0	29.0	29.0	28.0	28.0
55°	18.0	20.0	21.0	22.0	22.0	22.0	23.0	23.0	23.0	22.0	22.0
57.5°	15.0	16.0	17.0	18.0	18.0	18.0	19.0	19.0	19.0	18.0	18.0
60°	12.0	13.0	14.0	14.0	15.0	15.0	15.0	16.0	15.0	15.0	14.0
62.5°	10.0	11.0	11.0	12.0	12.0	13.0	13.0	13.0	13.0	13.0	12.0
65°	8.0	8.0	9.0	10.0	10.0	10.0	10.0	11.0	11.0	10.0	10.0
67.5°	6.0	7.0	7.0	8.0	8.0	8.0	8.0	9.0	9.0	9.0	8.0
70°	5.0	5.0	5.0	6.0	6.0	6.0	6.0	7.0	7.0	7.0	6.0
72.5°	3.0	3.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0
75°	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
77.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
80°	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
85°	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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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CATALOG NUMBER: ML4D09_27D2WE - TIR50WFL55 - TL45R6GMWWB - TL46S6GMWWB

CANDELA DISTRIBUTION (continued):

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7
2.5°	634.7	632.6	637.7	623.6	629.6	630.6	628.6	632.6	634.7	637.7	630.6
5°	618.6	618.6	620.6	606.6	614.6	614.6	611.6	616.6	617.6	621.6	613.6
7.5°	593.6	592.6	596.6	581.6	590.6	589.6	586.6	591.6	592.6	594.6	587.6
10°	557.6	559.6	562.6	548.6	559.6	554.6	552.6	556.6	557.6	559.6	552.6
12.5°	518.5	520.5	522.5	508.5	519.5	515.5	510.5	517.5	517.5	518.5	513.5
15°	473.5	475.5	477.5	464.5	473.5	471.5	465.5	470.5	469.5	470.5	466.5
17.5°	424.4	427.4	428.4	416.4	426.4	421.4	415.4	420.4	419.4	418.4	417.4
20°	377.4	378.4	377.4	368.4	377.4	370.4	367.4	369.4	368.4	369.4	364.4
22.5°	328.3	329.3	328.3	321.3	328.3	322.3	315.3	319.3	317.3	315.3	311.3
25°	285.3	284.3	283.3	276.3	282.3	276.3	270.3	272.3	270.3	265.3	263.3
27.5°	242.2	242.2	241.2	233.2	239.2	233.2	226.2	228.2	224.2	219.2	215.2
30°	204.2	204.2	202.2	198.2	200.2	195.2	189.2	187.2	182.2	179.2	172.2
32.5°	171.2	170.2	168.2	164.2	165.2	160.2	153.2	151.2	147.2	141.1	134.1
35°	141.1	141.1	138.1	134.1	137.1	130.1	123.1	122.1	116.1	110.1	104.1
37.5°	116.1	114.1	112.1	108.1	111.1	104.1	99.1	95.1	90.1	84.1	77.1
40°	93.1	92.1	91.1	87.1	88.1	83.1	78.1	74.1	69.1	64.1	58.1
42.5°	75.1	73.1	72.1	70.1	69.1	65.1	61.1	57.1	53.1	47.0	44.0
45°	58.1	57.1	56.1	55.1	55.1	51.1	47.0	44.0	40.0	36.0	32.0
47.5°	46.0	45.0	44.0	42.0	42.0	39.0	36.0	33.0	30.0	27.0	24.0
50°	36.0	34.0	33.0	33.0	33.0	30.0	27.0	25.0	23.0	20.0	18.0
52.5°	27.0	26.0	26.0	25.0	25.0	23.0	21.0	19.0	17.0	15.0	14.0
55°	21.0	20.0	20.0	19.0	19.0	17.0	16.0	15.0	13.0	12.0	11.0
57.5°	16.0	16.0	15.0	15.0	14.0	13.0	12.0	11.0	10.0	9.0	9.0
60°	14.0	13.0	12.0	12.0	11.0	10.0	10.0	9.0	8.0	7.0	7.0
62.5°	11.0	10.0	10.0	10.0	9.0	8.0	8.0	7.0	7.0	6.0	6.0
65°	9.0	9.0	8.0	8.0	8.0	7.0	6.0	6.0	5.0	5.0	5.0
67.5°	8.0	7.0	7.0	6.0	6.0	6.0	5.0	5.0	5.0	4.0	4.0
70°	6.0	6.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	3.0	3.0
72.5°	5.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
75°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
77.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
80°	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
85°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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: P300535

CATALOG NUMBER: ML4D09_27D2WE - TIR50WFL55 - TL45R6GMWWB - TL46S6GMWWB

CANDELA DISTRIBUTION (continued):

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7
2.5°	636.7	630.6	628.6	630.6	629.6	625.6	634.7	630.6
5°	620.6	613.6	611.6	612.6	611.6	607.6	616.6	613.6
7.5°	594.6	588.6	585.6	585.6	584.6	582.6	591.6	588.6
10°	560.6	554.6	552.6	552.6	551.6	546.6	556.6	555.6
12.5°	519.5	514.5	512.5	509.5	510.5	508.5	515.5	511.5
15°	473.5	466.5	465.5	464.5	463.5	460.5	467.5	468.5
17.5°	421.4	417.4	413.4	413.4	412.4	411.4	416.4	416.4
20°	368.4	363.4	362.4	359.4	359.4	358.4	360.4	364.4
22.5°	313.3	308.3	308.3	306.3	304.3	304.3	306.3	307.3
25°	262.3	258.3	252.3	254.3	251.3	248.3	252.3	251.3
27.5°	214.2	209.2	206.2	203.2	199.2	198.2	197.2	199.2
30°	170.2	164.2	159.2	158.2	153.2	152.2	152.2	149.2
32.5°	131.1	125.1	122.1	118.1	114.1	114.1	111.1	110.1
35°	99.1	93.1	90.1	88.1	83.1	80.1	79.1	79.1
37.5°	73.1	69.1	65.1	64.1	61.1	58.1	58.1	57.1
40°	54.1	50.1	48.0	46.0	43.0	43.0	42.0	41.0
42.5°	40.0	37.0	35.0	34.0	32.0	31.0	31.0	31.0
45°	29.0	27.0	26.0	26.0	24.0	24.0	24.0	24.0
47.5°	22.0	21.0	20.0	19.0	19.0	18.0	18.0	18.0
50°	17.0	16.0	15.0	15.0	14.0	14.0	14.0	14.0
52.5°	13.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0
55°	10.0	10.0	9.0	9.0	9.0	9.0	8.0	8.0
57.5°	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
60°	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
62.5°	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0
65°	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0
67.5°	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
70°	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
72.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
75°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
77.5°	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
80°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
85°	1.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)