

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: P300534

Luminaire Tested: **ML4D09\_27D2WE - TIR50WFL55 - TL45R6GMWBB - TL46S6GMWBB**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P300534  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-1902-156-48)  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: ML4D09\_27D2WE - TIR50WFL55 - TL45R6GMWBB - TL46S6GMWBB  
Description: ML4 2700K, 900LM DIM-TO-WARM, 55 DEG WFL OPTIC, WITH ROUND/SQUARE ASYMM WW, LINEAR SPREAD LENS, MATTE WHITE FLANGE, BLACK LENS FRAME  
Light Source: (1) HIGH LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 441.0 lumens  
Efficiency: N/A  
Efficacy: 39.4 lumens/watt  
Spacing Criteria (0/90/45): 0.72 / 0.73 / 0.75  
Luminous Opening: Circular (Dia: 0.19' x H: 0')  
CIE Type: Direct

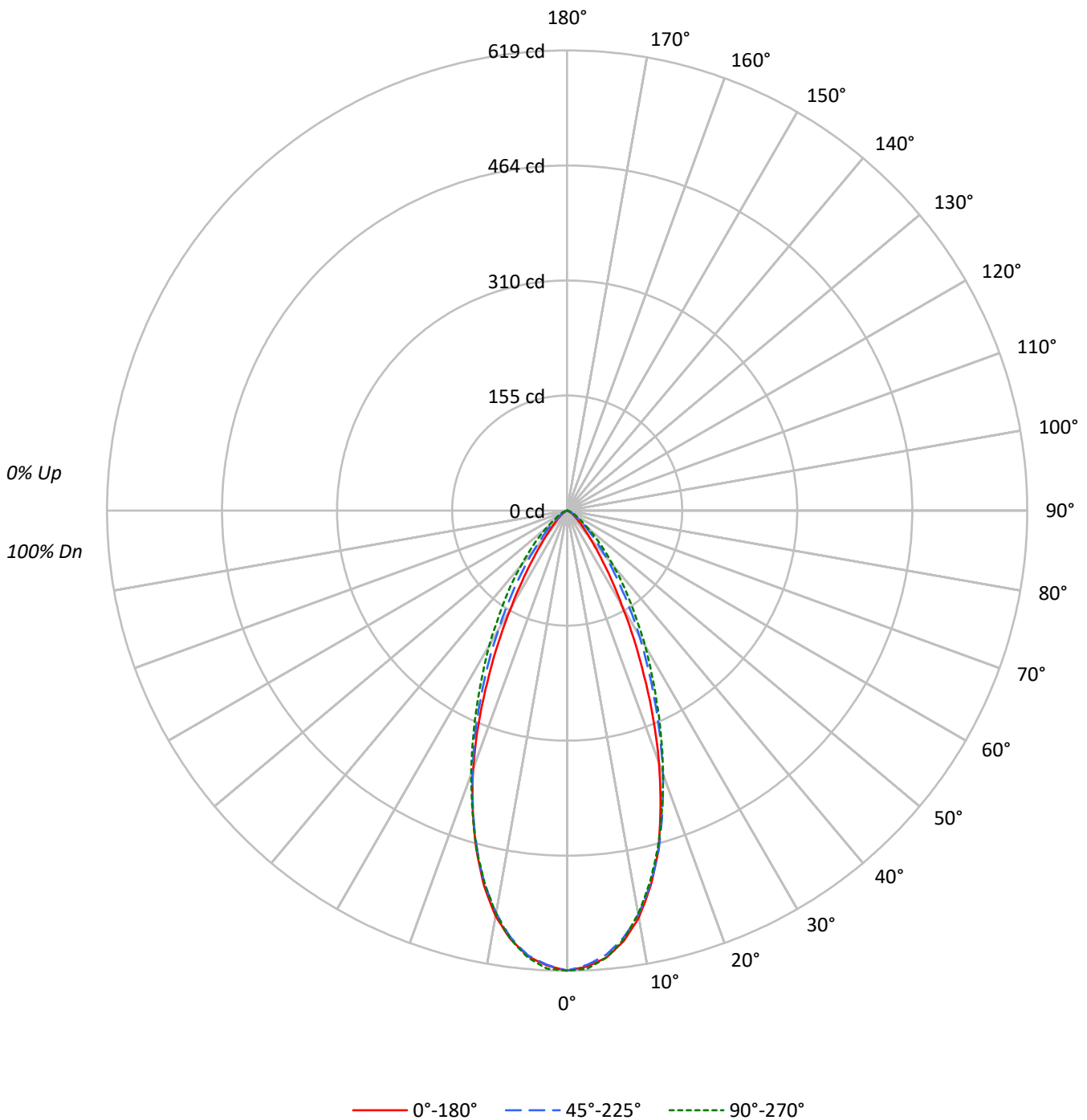
Input Watts (W): 11.2  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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### 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	111	108	106	111	108	106	104	104	103	101	101	99	98	97	96	95	93					93			
2	108	103	99	95	105	101	97	94	98	95	92	95	92	90	92	90	88	87					87			
3	102	96	91	87	100	94	90	86	92	88	84	89	86	83	87	84	82	80					80			
4	97	89	84	79	95	88	83	79	86	82	78	84	80	77	82	79	76	75					75			
5	92	84	78	73	90	83	77	73	81	76	72	79	75	72	78	74	71	70					70			
6	88	79	73	68	86	78	72	68	76	71	68	75	70	67	74	70	67	65					65			
7	83	74	68	64	82	73	68	64	72	67	63	71	66	63	70	66	63	61					61			
8	79	70	64	60	78	69	64	60	68	63	59	67	63	59	66	62	59	58					58			
9	76	66	60	56	75	66	60	56	65	60	56	64	59	56	63	59	56	54					54			
10	72	63	57	53	71	62	57	53	61	56	53	61	56	53	60	56	53	51					51			

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

	0°	90°	180°
0°	241228	241228	241228
5°	236280	236280	235497
10°	219972	217992	219180
15°	191137	189927	190330
20°	149969	156606	153287
25°	105081	122760	108953
30°	66261	94214	68061
35°	39547	69100	39071
40°	23460	48904	21424
45°	14885	33685	12680
50°	9704	21833	8491
55°	6797	14273	5437
60°	4678	10136	3898
65°	2767	7379	2767
70°	1140	5699	2280
75°	0	1506	1506
80°	0	0	0
85°	0	0	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	56.0	12.7
10°-20°	130.4	29.6
20°-30°	124.6	28.3
30°-40°	75.0	17.0
40°-50°	34.6	7.8
50°-60°	13.8	3.1
60°-70°	5.5	1.2
70°-80°	1.2	0.3
80°-90°	0.0	0.0
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°	310.9	70.5
0°-40°	385.9	87.5
0°-60°	434.3	98.5
0°-90°	441.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	441.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	619	619	619	619	619	
5°	604	600	604	601	602	56
15°	474	475	471	470	472	129
25°	244	276	285	272	253	112
35°	83	126	145	117	82	54
45°	27	48	61	39	23	22
55°	10	16	21	12	8	9
65°	3	6	8	4	3	3
75°	0	0	1	1	1	0
85°	0	0	0	0	0	0
90°	0	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°	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8
2.5°	613.8	612.8	614.8	617.8	612.8	612.8	616.8	613.8	611.8	613.8	611.8
5°	603.8	602.8	603.8	606.8	602.8	601.8	605.8	602.8	600.8	601.8	599.8
7.5°	583.8	582.7	585.8	588.8	584.8	582.7	586.8	583.8	582.7	582.7	579.7
10°	555.7	555.7	556.7	560.7	556.7	555.7	559.7	557.7	554.7	554.7	551.7
12.5°	517.7	518.7	518.7	522.7	520.7	518.7	518.7	518.7	516.7	517.7	515.7
15°	473.6	471.6	473.6	475.6	474.6	471.6	473.6	475.6	473.6	474.6	474.6
17.5°	417.5	417.5	421.5	423.5	421.5	421.5	426.5	425.5	423.5	424.5	425.5
20°	361.5	361.5	363.5	368.5	367.5	366.5	369.5	369.5	373.5	374.5	376.5
22.5°	302.4	304.4	305.4	308.4	310.4	310.4	314.4	316.4	319.4	322.4	325.4
25°	244.3	245.3	250.3	254.3	256.3	258.3	260.3	265.3	269.3	273.4	276.4
27.5°	193.2	194.2	196.3	202.3	207.3	209.3	212.3	218.3	222.3	227.3	232.3
30°	147.2	149.2	152.2	158.2	162.2	165.2	167.2	174.2	179.2	186.2	193.2
32.5°	113.1	112.1	114.1	119.2	125.2	127.2	129.2	138.2	144.2	152.2	157.2
35°	83.1	83.1	85.1	89.1	93.1	96.1	100.1	107.1	113.1	121.2	126.2
37.5°	61.1	62.1	63.1	67.1	70.1	72.1	75.1	81.1	87.1	94.1	101.1
40°	46.1	46.1	48.1	50.1	53.1	54.1	57.1	62.1	68.1	74.1	79.1
42.5°	34.0	35.0	36.0	38.0	40.1	42.1	43.1	47.1	52.1	57.1	62.1
45°	27.0	27.0	28.0	29.0	30.0	32.0	33.0	36.0	40.1	43.1	48.1
47.5°	21.0	21.0	22.0	22.0	24.0	24.0	25.0	28.0	31.0	33.0	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	13.0	14.0	15.0	15.0	16.0	17.0	18.0	20.0	21.0
55°	10.0	10.0	11.0	11.0	12.0	12.0	12.0	13.0	14.0	15.0	16.0
57.5°	8.0	8.0	8.0	9.0	9.0	9.0	10.0	10.0	11.0	12.0	12.0
60°	6.0	6.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	9.0	10.0
62.5°	5.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	7.0	7.0
65°	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	6.0
67.5°	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0
70°	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0
72.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
75°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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°	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8
2.5°	615.8	613.8	616.8	612.8	613.8	614.8	616.8	614.8	614.8	616.8	615.8
5°	603.8	600.8	603.8	600.8	601.8	601.8	604.8	601.8	601.8	603.8	602.8
7.5°	583.8	580.7	581.7	578.7	579.7	580.7	581.7	579.7	579.7	581.7	580.7
10°	553.7	552.7	552.7	550.7	550.7	550.7	552.7	549.7	548.7	550.7	550.7
12.5°	516.7	518.7	514.7	513.7	514.7	513.7	514.7	510.7	510.7	512.7	511.7
15°	475.6	473.6	472.6	470.6	473.6	472.6	473.6	469.6	468.6	470.6	468.6
17.5°	429.6	428.6	426.5	426.5	424.5	425.5	424.5	423.5	422.5	423.5	424.5
20°	376.5	379.5	377.5	378.5	377.5	377.5	376.5	376.5	373.5	377.5	376.5
22.5°	329.4	331.4	331.4	332.4	333.4	331.4	334.4	329.4	330.4	330.4	329.4
25°	281.4	285.4	285.4	288.4	288.4	288.4	287.4	286.4	285.4	285.4	285.4
27.5°	238.3	241.3	242.3	245.3	246.3	247.3	247.3	245.3	244.3	245.3	244.3
30°	198.3	203.3	204.3	208.3	209.3	208.3	210.3	208.3	207.3	209.3	207.3
32.5°	163.2	167.2	170.2	173.2	175.2	174.2	176.2	175.2	173.2	174.2	174.2
35°	132.2	137.2	141.2	143.2	145.2	144.2	146.2	145.2	143.2	145.2	143.2
37.5°	106.1	111.1	113.1	117.2	118.2	119.2	119.2	119.2	118.2	120.2	117.2
40°	84.1	89.1	90.1	94.1	95.1	96.1	97.1	97.1	96.1	96.1	95.1
42.5°	65.1	70.1	72.1	74.1	76.1	77.1	77.1	77.1	76.1	77.1	77.1
45°	51.1	55.1	56.1	59.1	60.1	60.1	61.1	60.1	60.1	61.1	60.1
47.5°	39.1	42.1	44.1	45.1	46.1	46.1	47.1	47.1	47.1	47.1	47.1
50°	30.0	32.0	33.0	35.0	35.0	35.0	36.0	35.0	35.0	36.0	35.0
52.5°	23.0	24.0	25.0	26.0	26.0	27.0	27.0	27.0	27.0	27.0	26.0
55°	17.0	18.0	19.0	20.0	20.0	21.0	21.0	21.0	21.0	21.0	20.0
57.5°	13.0	14.0	15.0	16.0	16.0	16.0	17.0	17.0	16.0	16.0	16.0
60°	10.0	11.0	12.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
62.5°	8.0	9.0	9.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	10.0
65°	6.0	7.0	7.0	8.0	8.0	8.0	9.0	9.0	9.0	8.0	8.0
67.5°	5.0	5.0	5.0	6.0	6.0	6.0	7.0	7.0	7.0	7.0	6.0
70°	3.0	3.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0
72.5°	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
75°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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):**

	100°	105°	110°	112.5°	115°	120°	125°	130°	135°	140°	145°
0°	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8
2.5°	614.8	615.8	614.8	615.8	615.8	613.8	613.8	617.8	611.8	615.8	615.8
5°	600.8	602.8	602.8	602.8	602.8	601.8	600.8	605.8	600.8	603.8	603.8
7.5°	578.7	579.7	580.7	581.7	581.7	579.7	580.7	584.8	579.7	583.8	583.8
10°	548.7	549.7	549.7	551.7	551.7	550.7	550.7	554.7	549.7	553.7	553.7
12.5°	512.7	512.7	513.7	513.7	514.7	513.7	513.7	517.7	513.7	518.7	518.7
15°	468.6	469.6	469.6	471.6	471.6	469.6	470.6	476.6	469.6	473.6	474.6
17.5°	423.5	421.5	423.5	424.5	426.5	423.5	423.5	427.5	421.5	425.5	424.5
20°	375.5	375.5	376.5	377.5	378.5	375.5	374.5	377.5	371.5	373.5	373.5
22.5°	329.4	329.4	330.4	329.4	327.4	325.4	325.4	326.4	322.4	322.4	321.4
25°	284.4	285.4	285.4	283.4	282.4	279.4	276.4	276.4	272.4	271.3	267.3
27.5°	244.3	243.3	242.3	241.3	239.3	235.3	233.3	233.3	227.3	223.3	221.3
30°	206.3	205.3	202.3	201.3	201.3	197.3	193.2	191.2	184.2	183.2	175.2
32.5°	172.2	171.2	169.2	167.2	167.2	162.2	158.2	156.2	148.2	144.2	137.2
35°	142.2	141.2	139.2	137.2	135.2	132.2	126.2	123.2	117.2	112.1	105.1
37.5°	116.1	115.1	113.1	112.1	109.1	106.1	101.1	97.1	90.1	86.1	80.1
40°	94.1	93.1	91.1	89.1	88.1	84.1	79.1	76.1	69.1	64.1	58.1
42.5°	75.1	74.1	72.1	70.1	69.1	66.1	62.1	58.1	52.1	48.1	43.1
45°	59.1	57.1	56.1	56.1	54.1	51.1	48.1	44.1	39.1	36.0	32.0
47.5°	46.1	45.1	43.1	42.1	42.1	39.1	36.0	33.0	29.0	26.0	24.0
50°	35.0	34.0	33.0	33.0	31.0	30.0	27.0	25.0	22.0	20.0	18.0
52.5°	26.0	25.0	25.0	24.0	24.0	22.0	20.0	18.0	16.0	15.0	14.0
55°	19.0	19.0	18.0	18.0	18.0	16.0	15.0	14.0	12.0	11.0	10.0
57.5°	15.0	14.0	13.0	13.0	13.0	12.0	11.0	10.0	9.0	9.0	8.0
60°	12.0	11.0	10.0	10.0	10.0	9.0	8.0	8.0	7.0	7.0	6.0
62.5°	9.0	9.0	8.0	8.0	8.0	7.0	6.0	6.0	6.0	5.0	5.0
65°	8.0	7.0	6.0	6.0	6.0	5.0	5.0	5.0	4.0	4.0	4.0
67.5°	6.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	3.0	3.0	3.0
70°	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
72.5°	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
75°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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





TEST NUMBER: P300534

CATALOG NUMBER: ML4D09\_27D2WE - TIR50WFL55 - TL45R6GMWBB - TL46S6GMWBB

**CANDELA DISTRIBUTION (continued):**

	150°	155°	157.5°	160°	165°	170°	175°	180°
0°	618.8	618.8	618.8	618.8	618.8	618.8	618.8	618.8
2.5°	615.8	616.8	612.8	616.8	617.8	612.8	618.8	612.8
5°	604.8	605.8	601.8	604.8	606.8	600.8	607.8	601.8
7.5°	584.8	585.8	580.7	585.8	585.8	581.7	586.8	581.7
10°	556.7	555.7	552.7	556.7	557.7	551.7	558.7	553.7
12.5°	518.7	518.7	515.7	518.7	519.7	516.7	521.7	516.7
15°	474.6	476.6	472.6	473.6	477.6	471.6	474.6	471.6
17.5°	426.5	425.5	422.5	425.5	424.5	421.5	424.5	422.5
20°	372.5	372.5	370.5	368.5	371.5	366.5	370.5	369.5
22.5°	318.4	318.4	314.4	314.4	315.4	311.4	313.4	312.4
25°	264.3	264.3	260.3	260.3	260.3	256.3	258.3	253.3
27.5°	216.3	214.3	209.3	208.3	205.3	201.3	199.3	200.3
30°	169.2	166.2	164.2	160.2	157.2	152.2	152.2	151.2
32.5°	132.2	127.2	124.2	123.2	117.2	113.1	113.1	112.1
35°	99.1	94.1	91.1	88.1	87.1	82.1	81.1	82.1
37.5°	74.1	69.1	67.1	65.1	62.1	59.1	58.1	58.1
40°	54.1	51.1	49.1	47.1	44.1	43.1	42.1	42.1
42.5°	40.1	37.0	36.0	35.0	33.0	32.0	31.0	31.0
45°	29.0	28.0	27.0	26.0	25.0	24.0	23.0	23.0
47.5°	22.0	20.0	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	9.0	9.0	9.0	8.0	8.0	8.0	8.0
57.5°	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0
60°	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
62.5°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
65°	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
67.5°	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
70°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
72.5°	2.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0
75°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)