

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: P123732

Luminaire Tested: **EL406940-TL409WW**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P123732  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P13991)  
Test Lab: INNOVATION CENTER-P1  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: EL406940-TL409WW  
Description: HALO 4-INCH RECESSED LED DOWNLIGHT  
WALL-WASH WITH SEMI-SPECULAR REFLECTOR AND WHITE TRIM RING  
Light Source: (1)SURFACE MOUNT LED, 4000K CCT, 90CRI  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 780.0 lumens  
Efficiency: N/A  
Efficacy: 60.0 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.24 / 1.22  
Luminous Opening: Circular (Dia: 0.29' x H: 0')  
CIE Type: Direct

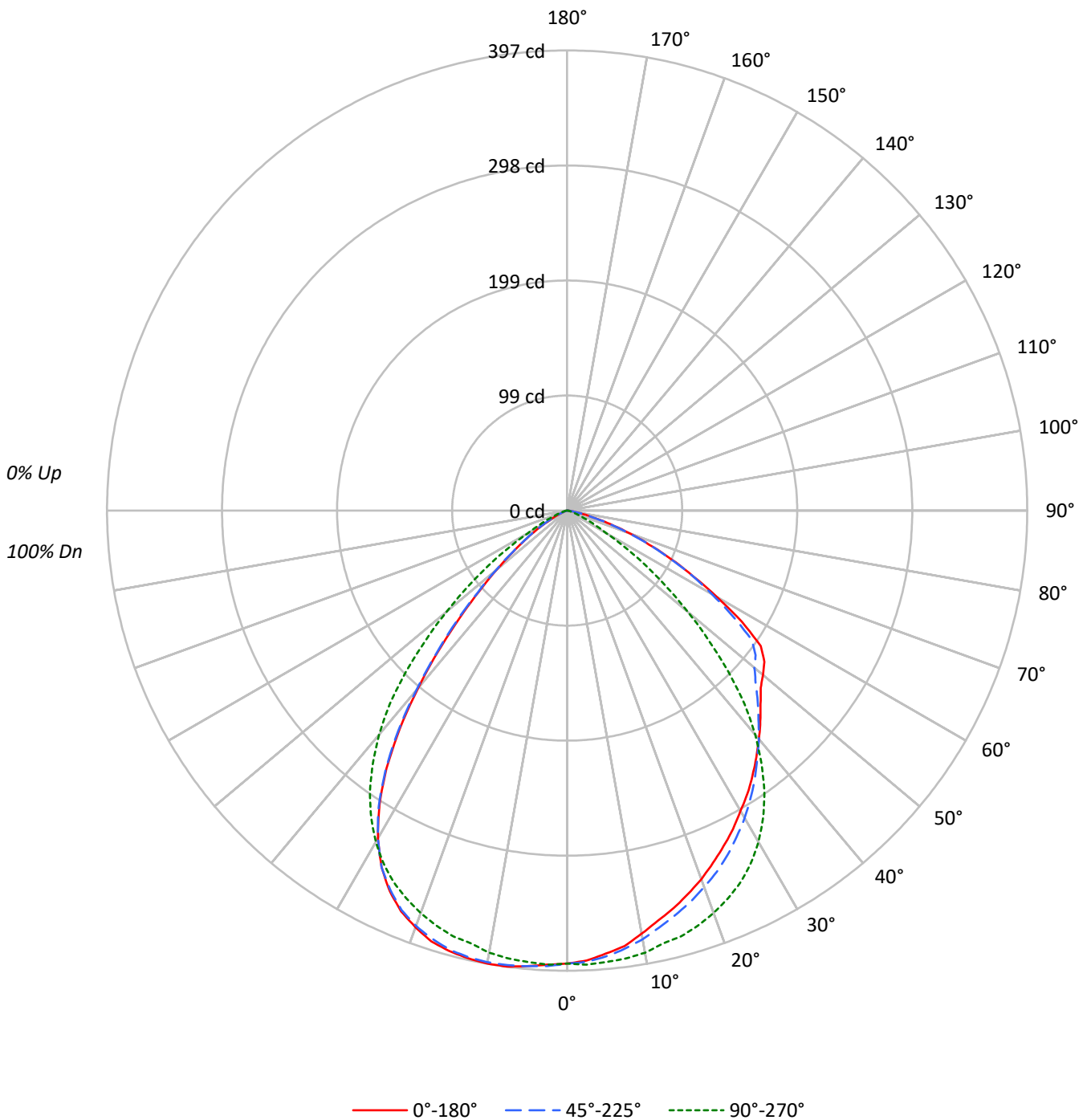
Input Watts (W): 13  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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CATALOG NUMBER: EL406940-TL409WW

### 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	111	108	104	101	109	105	102	100	101	99	96	97	95	94	94	92	91	89					89			
2	103	96	91	86	101	95	90	85	91	87	83	88	85	81	85	82	80	78					78			
3	95	87	80	74	93	85	79	74	82	77	72	80	75	71	77	73	70	68					68			
4	88	78	71	65	86	77	70	64	74	68	64	72	67	63	70	66	62	60					60			
5	82	71	63	57	80	70	62	57	68	61	56	66	60	56	64	59	55	53					53			
6	76	64	57	51	75	64	56	51	62	55	50	60	54	50	59	54	49	48					48			
7	71	59	51	46	70	58	51	46	57	50	45	55	49	45	54	49	45	43					43			
8	67	54	47	41	65	54	46	41	52	46	41	51	45	41	50	45	40	39					39			
9	62	50	43	38	61	50	42	37	48	42	37	47	41	37	46	41	37	35					35			
10	59	46	39	34	57	46	39	34	45	39	34	44	38	34	43	38	34	32					32			

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

	0°	90°	180°
0°	62975	62975	62975
5°	62052	63216	63798
10°	60626	63358	64912
15°	59226	63412	65597
20°	58016	63331	65577
25°	56776	62909	64402
30°	55641	61407	60738
35°	54852	58352	53436
40°	54133	53123	42103
45°	53769	44792	29869
50°	55265	34061	19725
55°	57243	23425	12387
60°	48009	12663	6927
65°	37701	7281	3164
70°	26943	3910	1696
75°	14814	2241	747
80°	6680	1113	0
85°	4436	0	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	37.1	4.8
10°-20°	106.3	13.6
20°-30°	158.7	20.3
30°-40°	174.5	22.4
40°-50°	143.8	18.4
50°-60°	98.6	12.6
60°-70°	46.9	6.0
70°-80°	12.8	1.6
80°-90°	1.3	0.2
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°	302.1	38.7
0°-40°	476.6	61.1
0°-60°	719.0	92.2
0°-90°	780.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	780.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	391	391	391	391	391	
5°	384	386	391	394	394	36
15°	355	361	380	392	393	100
25°	319	328	354	361	362	147
35°	279	282	297	273	272	175
45°	236	232	197	135	131	183
55°	204	194	83	45	44	175
65°	99	98	19	10	8	99
75°	24	24	4	1	1	29
85°	2	2	0	0	0	3
90°	0	0	0	0	0	



TEST NUMBER: P123732

CATALOG NUMBER: EL406940-TL409WW

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9
2.5°	388.5	388.5	388.5	388.5	388.5	388.5	388.5	388.5	387.3	389.7	389.7
5°	383.7	382.5	383.7	383.7	383.7	383.7	383.7	383.7	384.9	386.1	386.1
7.5°	379.0	377.8	377.8	377.8	377.8	380.2	379.0	380.2	380.2	381.3	381.3
10°	370.6	370.6	370.6	370.6	371.8	371.8	371.8	373.0	374.2	375.4	375.4
12.5°	362.3	362.3	362.3	362.3	363.5	364.7	364.7	365.9	367.0	368.2	369.4
15°	355.1	355.1	355.1	355.1	355.1	356.3	357.5	358.7	359.9	361.1	362.3
17.5°	346.8	346.8	346.8	348.0	348.0	348.0	349.2	350.4	351.6	353.9	355.1
20°	338.4	338.4	338.4	338.4	339.6	339.6	340.8	342.0	344.4	345.6	348.0
22.5°	328.9	328.9	328.9	328.9	330.1	331.3	331.3	333.7	334.9	337.3	339.6
25°	319.4	319.4	319.4	319.4	320.6	320.6	321.8	323.0	325.3	327.7	330.1
27.5°	309.8	309.8	309.8	309.8	309.8	311.0	312.2	313.4	314.6	317.0	318.2
30°	299.1	299.1	300.3	300.3	300.3	301.5	301.5	302.7	303.9	306.3	307.5
32.5°	289.6	289.6	289.6	288.4	289.6	289.6	290.8	292.0	292.0	294.4	295.5
35°	278.9	278.9	278.9	278.9	278.9	278.9	278.9	278.9	281.2	282.4	283.6
37.5°	268.1	266.9	268.1	266.9	266.9	268.1	266.9	268.1	269.3	269.3	270.5
40°	257.4	257.4	257.4	256.2	256.2	256.2	256.2	257.4	256.2	257.4	257.4
42.5°	246.7	246.7	245.5	245.5	245.5	245.5	244.3	244.3	244.3	244.3	244.3
45°	236.0	236.0	236.0	234.8	234.8	233.6	233.6	232.4	232.4	232.4	230.0
47.5°	226.4	226.4	226.4	225.2	224.0	222.8	222.8	221.7	220.5	220.5	218.1
50°	220.5	219.3	219.3	218.1	216.9	215.7	214.5	214.5	212.1	210.9	208.5
52.5°	214.5	214.5	213.3	212.1	210.9	209.7	208.5	207.4	207.4	205.0	201.4
55°	203.8	203.8	202.6	200.2	199.0	197.8	197.8	196.6	196.6	194.2	190.7
57.5°	178.8	178.8	177.6	176.4	175.2	174.0	172.8	171.6	171.6	169.2	166.8
60°	149.0	149.0	147.8	146.6	146.6	145.4	145.4	145.4	144.2	144.2	141.8
62.5°	122.7	122.7	122.7	121.6	121.6	120.4	120.4	120.4	121.6	121.6	120.4
65°	98.9	98.9	98.9	98.9	97.7	97.7	97.7	97.7	98.9	97.7	97.7
67.5°	76.3	76.3	76.3	76.3	75.1	75.1	75.1	75.1	76.3	76.3	76.3
70°	57.2	56.0	57.2	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
72.5°	39.3	38.1	39.3	39.3	39.3	39.3	39.3	38.1	38.1	38.1	38.1
75°	23.8	25.0	25.0	25.0	25.0	25.0	25.0	25.0	23.8	23.8	23.8
77.5°	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	13.1
80°	7.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	7.2	7.2	7.2
82.5°	3.6	3.6	3.6	4.8	4.8	4.8	3.6	3.6	3.6	3.6	3.6
85°	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
87.5°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
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):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9
2.5°	389.7	389.7	389.7	390.9	390.9	390.9	392.1	392.1	392.1	392.1	392.1
5°	386.1	386.1	387.3	388.5	388.5	389.7	390.9	390.9	390.9	390.9	392.1
7.5°	382.5	383.7	383.7	386.1	386.1	387.3	388.5	389.7	389.7	390.9	392.1
10°	376.6	379.0	380.2	381.3	382.5	384.9	386.1	387.3	388.5	389.7	390.9
12.5°	370.6	371.8	374.2	376.6	377.8	380.2	381.3	382.5	384.9	386.1	387.3
15°	364.7	365.9	369.4	371.8	373.0	375.4	377.8	380.2	381.3	382.5	384.9
17.5°	357.5	359.9	362.3	365.9	368.2	370.6	373.0	375.4	377.8	379.0	380.2
20°	350.4	352.7	356.3	358.7	361.1	364.7	367.0	369.4	371.8	373.0	375.4
22.5°	340.8	344.4	346.8	351.6	353.9	357.5	359.9	362.3	364.7	365.9	367.0
25°	331.3	334.9	338.4	342.0	344.4	348.0	351.6	353.9	355.1	356.3	357.5
27.5°	321.8	324.1	327.7	331.3	334.9	338.4	340.8	343.2	344.4	345.6	345.6
30°	309.8	313.4	317.0	320.6	323.0	326.5	328.9	330.1	330.1	331.3	330.1
32.5°	297.9	300.3	303.9	307.5	309.8	312.2	314.6	314.6	314.6	313.4	311.0
35°	286.0	287.2	289.6	292.0	294.4	295.5	296.7	296.7	294.4	290.8	287.2
37.5°	271.7	272.9	275.3	276.5	277.7	277.7	277.7	275.3	271.7	266.9	259.8
40°	258.6	258.6	258.6	259.8	258.6	257.4	256.2	252.6	245.5	238.3	230.0
42.5°	243.1	243.1	241.9	240.7	238.3	236.0	231.2	226.4	218.1	208.5	199.0
45°	228.8	226.4	224.0	220.5	215.7	209.7	203.8	196.6	188.3	177.6	166.8
47.5°	214.5	210.9	205.0	199.0	190.7	182.3	175.2	165.6	156.1	145.4	134.7
50°	203.8	197.8	189.5	179.9	168.0	157.3	146.6	135.9	125.1	115.6	106.1
52.5°	196.6	188.3	177.6	163.3	147.8	133.5	119.2	108.4	97.7	89.4	81.0
55°	185.9	176.4	163.3	147.8	128.7	110.8	95.3	83.4	73.9	66.7	59.6
57.5°	162.1	152.5	139.4	121.6	102.5	85.8	70.3	59.6	52.4	46.5	41.7
60°	138.2	129.9	116.8	98.9	81.0	63.2	48.9	39.3	33.4	29.8	27.4
62.5°	116.8	110.8	97.7	82.2	64.4	47.7	35.8	27.4	22.6	19.1	17.9
65°	96.5	90.6	79.8	65.5	51.2	36.9	25.0	19.1	14.3	13.1	11.9
67.5°	75.1	70.3	62.0	51.2	38.1	26.2	17.9	11.9	9.5	8.3	7.2
70°	54.8	52.4	46.5	38.1	28.6	19.1	13.1	8.3	6.0	4.8	4.8
72.5°	38.1	35.8	32.2	26.2	19.1	13.1	8.3	6.0	3.6	3.6	2.4
75°	23.8	22.6	20.3	16.7	11.9	8.3	4.8	3.6	2.4	2.4	2.4
77.5°	13.1	11.9	10.7	9.5	7.2	4.8	3.6	2.4	2.4	1.2	1.2
80°	7.2	6.0	6.0	4.8	3.6	2.4	2.4	1.2	1.2	1.2	1.2
82.5°	3.6	3.6	3.6	2.4	2.4	1.2	1.2	1.2	1.2	1.2	0.0
85°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0
87.5°	1.2	1.2	1.2	1.2	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):**

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9	390.9
2.5°	392.1	392.1	392.1	393.3	393.3	393.3	393.3	393.3	392.1	393.3	393.3
5°	393.3	392.1	393.3	394.5	394.5	394.5	395.6	395.6	395.6	395.6	395.6
7.5°	393.3	393.3	393.3	394.5	395.6	395.6	396.8	396.8	396.8	396.8	398.0
10°	392.1	392.1	393.3	394.5	395.6	395.6	395.6	396.8	396.8	396.8	398.0
12.5°	388.5	389.7	390.9	392.1	394.5	394.5	394.5	395.6	395.6	395.6	395.6
15°	384.9	387.3	388.5	389.7	390.9	392.1	392.1	393.3	393.3	393.3	394.5
17.5°	381.3	382.5	383.7	386.1	387.3	387.3	388.5	388.5	388.5	389.7	389.7
20°	376.6	377.8	379.0	380.2	381.3	381.3	382.5	382.5	382.5	382.5	383.7
22.5°	369.4	369.4	370.6	371.8	371.8	373.0	373.0	374.2	374.2	374.2	374.2
25°	358.7	358.7	359.9	359.9	361.1	361.1	361.1	361.1	362.3	362.3	362.3
27.5°	345.6	345.6	345.6	345.6	345.6	346.8	346.8	346.8	346.8	346.8	346.8
30°	328.9	328.9	327.7	327.7	327.7	326.5	326.5	327.7	327.7	326.5	327.7
32.5°	308.7	306.3	303.9	303.9	302.7	302.7	301.5	301.5	301.5	301.5	301.5
35°	283.6	278.9	276.5	274.1	274.1	272.9	271.7	271.7	271.7	271.7	271.7
37.5°	253.8	247.9	244.3	241.9	239.5	239.5	238.3	238.3	238.3	237.1	238.3
40°	221.7	214.5	209.7	206.2	203.8	202.6	202.6	202.6	201.4	201.4	201.4
42.5°	188.3	179.9	174.0	170.4	168.0	166.8	166.8	166.8	165.6	165.6	165.6
45°	156.1	146.6	140.6	137.0	134.7	134.7	133.5	133.5	132.3	132.3	133.5
47.5°	125.1	116.8	110.8	107.3	106.1	104.9	103.7	103.7	103.7	103.7	103.7
50°	97.7	90.6	85.8	83.4	81.0	81.0	79.8	79.8	79.8	79.8	79.8
52.5°	73.9	67.9	64.4	63.2	62.0	60.8	60.8	60.8	60.8	60.8	59.6
55°	54.8	50.1	47.7	46.5	46.5	45.3	45.3	45.3	45.3	45.3	45.3
57.5°	38.1	36.9	34.6	34.6	33.4	33.4	33.4	32.2	32.2	32.2	32.2
60°	26.2	25.0	23.8	23.8	22.6	22.6	22.6	22.6	22.6	21.5	21.5
62.5°	16.7	16.7	16.7	15.5	15.5	15.5	14.3	15.5	14.3	14.3	14.3
65°	10.7	10.7	10.7	9.5	9.5	9.5	9.5	9.5	9.5	8.3	8.3
67.5°	7.2	6.0	6.0	6.0	6.0	4.8	4.8	4.8	4.8	4.8	4.8
70°	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	2.4	2.4
72.5°	2.4	2.4	2.4	2.4	1.2	1.2	2.4	1.2	1.2	1.2	1.2
75°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
77.5°	1.2	1.2	1.2	1.2	0.0	0.0	0.0	1.2	0.0	0.0	1.2
80°	1.2	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: P123732

CATALOG NUMBER: EL406940-TL409WW

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	390.9	390.9	390.9	390.9
2.5°	393.3	393.3	393.3	392.1
5°	395.6	395.6	395.6	394.5
7.5°	399.2	398.0	398.0	396.8
10°	398.0	398.0	398.0	396.8
12.5°	396.8	396.8	396.8	395.6
15°	395.6	394.5	394.5	393.3
17.5°	390.9	390.9	390.9	389.7
20°	384.9	384.9	384.9	382.5
22.5°	375.4	375.4	375.4	374.2
25°	363.5	363.5	363.5	362.3
27.5°	348.0	348.0	348.0	346.8
30°	327.7	327.7	327.7	326.5
32.5°	302.7	302.7	302.7	301.5
35°	271.7	272.9	272.9	271.7
37.5°	238.3	238.3	238.3	237.1
40°	201.4	201.4	201.4	200.2
42.5°	165.6	165.6	165.6	164.5
45°	132.3	132.3	132.3	131.1
47.5°	102.5	102.5	102.5	102.5
50°	78.7	78.7	78.7	78.7
52.5°	59.6	59.6	59.6	59.6
55°	44.1	44.1	44.1	44.1
57.5°	32.2	32.2	31.0	32.2
60°	21.5	21.5	21.5	21.5
62.5°	14.3	14.3	14.3	14.3
65°	8.3	8.3	8.3	8.3
67.5°	4.8	4.8	4.8	4.8
70°	3.6	2.4	2.4	3.6
72.5°	1.2	1.2	1.2	1.2
75°	1.2	1.2	1.2	1.2
77.5°	0.0	0.0	0.0	0.0
80°	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0
90°	0.0	0.0	0.0	0.0

(END OF REPORT)