

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: P123729

Luminaire Tested: **EL406927-TL409WW**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P123729  
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: EL406927-TL409WW  
Description: HALO 4-INCH RECESSED LED DOWNLIGHT  
WALL-WASH WITH SEMI-SPECULAR REFLECTOR AND WHITE TRIM RING  
Light Source: (1)SURFACE MOUNT LED, 2700K CCT, 90CRI  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 640.0 lumens  
Efficiency: N/A  
Efficacy: 49.2 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

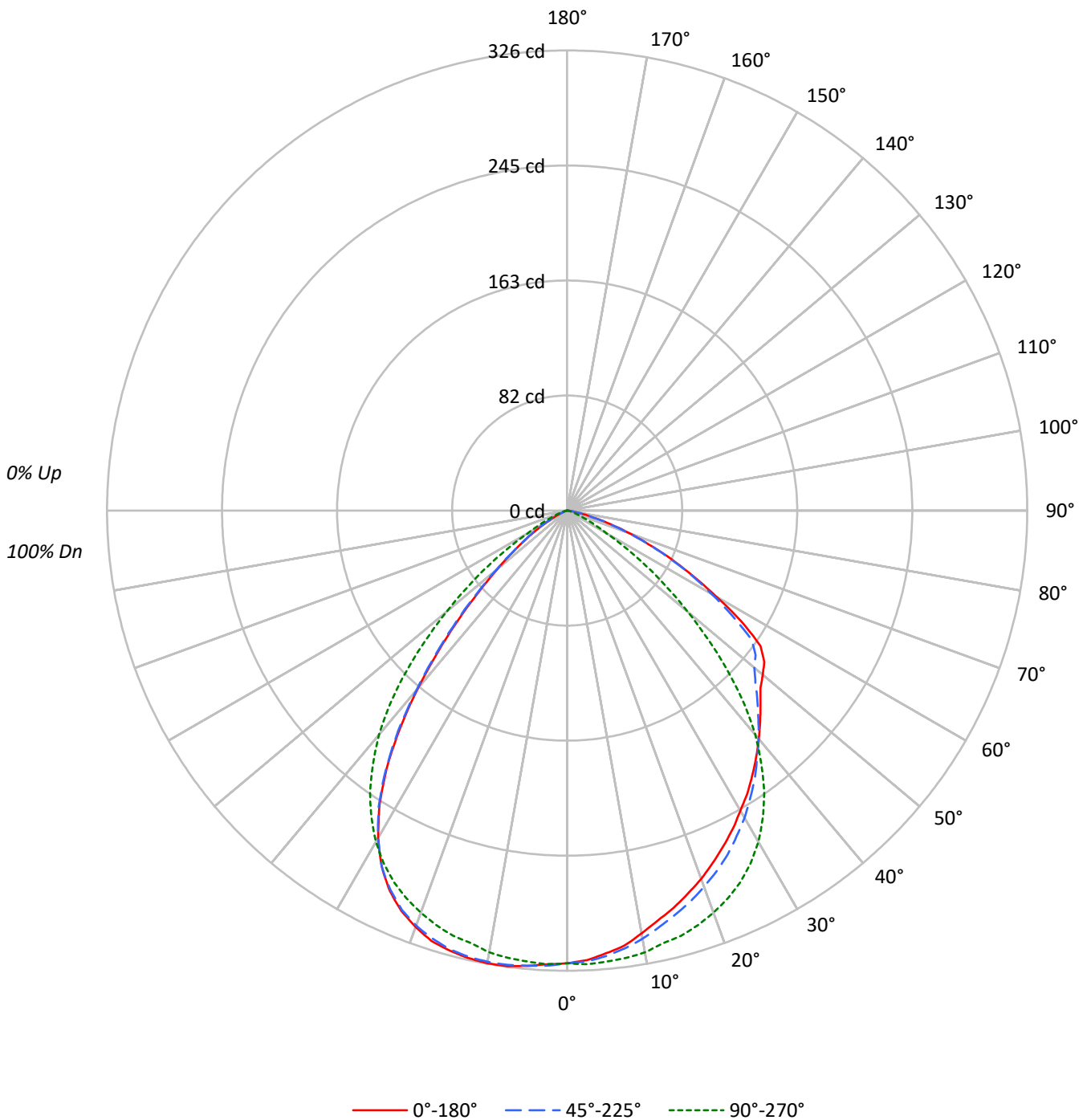
Input Watts (W): 13  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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### 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	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	111	108	104	101	109	105	102	100	101	99	96	97	95	94	94	92	91	89
2	103	96	91	86	101	95	90	85	91	87	83	88	85	81	85	82	80	78
3	95	87	80	74	93	85	79	74	82	77	72	80	75	71	77	73	70	68
4	88	78	71	65	86	77	70	64	74	68	64	72	67	63	70	66	62	60
5	82	71	63	57	80	70	62	57	68	61	56	66	60	56	64	59	55	53
6	76	64	57	51	75	64	56	51	62	55	50	60	54	50	59	54	49	48
7	71	59	51	46	70	58	51	46	57	50	45	55	49	45	54	49	45	43
8	67	54	47	41	65	54	46	41	52	46	41	51	45	41	50	45	40	39
9	62	50	43	38	61	50	42	37	48	42	37	47	41	37	46	41	37	35
10	59	46	39	34	57	46	39	34	45	39	34	44	38	34	43	38	34	32

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

	0°	90°	180°
0°	51666	51666	51666
5°	50925	51863	52349
10°	49747	51989	53265
15°	48602	52021	53822
20°	47610	51964	53816
25°	46590	51621	52848
30°	45651	50395	49837
35°	44998	47889	43838
40°	44417	43596	34553
45°	44109	36750	24515
50°	45340	27946	16166
55°	46962	19212	10168
60°	39374	10407	5671
65°	30954	5947	2592
70°	22092	3203	1366
75°	12200	1805	622
80°	5474	928	0
85°	3697	0	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	30.4	4.8
10°-20°	87.2	13.6
20°-30°	130.2	20.3
30°-40°	143.2	22.4
40°-50°	118.0	18.4
50°-60°	80.9	12.6
60°-70°	38.5	6.0
70°-80°	10.5	1.6
80°-90°	1.1	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°	247.9	38.7
0°-40°	391.1	61.1
0°-60°	589.9	92.2
0°-90°	640.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	640.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	321	321	321	321	321	
5°	315	317	321	324	324	30
15°	291	296	312	322	323	82
25°	262	269	290	296	297	121
35°	229	232	244	224	223	143
45°	194	191	161	110	108	150
55°	167	159	68	37	36	143
65°	81	80	16	8	7	81
75°	20	20	3	1	1	24
85°	2	2	0	0	0	2
90°	0	0	0	0	0	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7
2.5°	318.8	318.8	318.8	318.8	318.8	318.8	318.8	318.8	317.8	319.7	319.7
5°	314.9	313.9	314.9	314.9	314.9	314.9	314.9	314.9	315.8	316.8	316.8
7.5°	310.9	310.0	310.0	310.0	310.0	311.9	310.9	311.9	311.9	312.9	312.9
10°	304.1	304.1	304.1	304.1	305.1	305.1	305.1	306.1	307.0	308.0	308.0
12.5°	297.3	297.3	297.3	297.3	298.2	299.2	299.2	300.2	301.2	302.1	303.1
15°	291.4	291.4	291.4	291.4	291.4	292.4	293.3	294.3	295.3	296.3	297.3
17.5°	284.5	284.5	284.5	285.5	285.5	285.5	286.5	287.5	288.5	290.4	291.4
20°	277.7	277.7	277.7	277.7	278.7	278.7	279.7	280.6	282.6	283.6	285.5
22.5°	269.9	269.9	269.9	269.9	270.9	271.8	271.8	273.8	274.8	276.7	278.7
25°	262.1	262.1	262.1	262.1	263.0	263.0	264.0	265.0	266.9	268.9	270.9
27.5°	254.2	254.2	254.2	254.2	254.2	255.2	256.2	257.2	258.1	260.1	261.1
30°	245.4	245.4	246.4	246.4	246.4	247.4	247.4	248.4	249.3	251.3	252.3
32.5°	237.6	237.6	237.6	236.6	237.6	237.6	238.6	239.6	239.6	241.5	242.5
35°	228.8	228.8	228.8	228.8	228.8	228.8	228.8	228.8	230.8	231.7	232.7
37.5°	220.0	219.0	220.0	219.0	219.0	220.0	219.0	220.0	221.0	221.0	222.0
40°	211.2	211.2	211.2	210.2	210.2	210.2	210.2	211.2	210.2	211.2	211.2
42.5°	202.4	202.4	201.4	201.4	201.4	201.4	200.5	200.5	200.5	200.5	200.5
45°	193.6	193.6	193.6	192.6	192.6	191.7	191.7	190.7	190.7	190.7	188.7
47.5°	185.8	185.8	185.8	184.8	183.8	182.9	182.9	181.9	180.9	180.9	178.9
50°	180.9	179.9	179.9	178.9	178.0	177.0	176.0	176.0	174.0	173.1	171.1
52.5°	176.0	176.0	175.0	174.0	173.1	172.1	171.1	170.1	170.1	168.2	165.2
55°	167.2	167.2	166.2	164.3	163.3	162.3	162.3	161.3	161.3	159.4	156.4
57.5°	146.7	146.7	145.7	144.7	143.7	142.8	141.8	140.8	140.8	138.8	136.9
60°	122.2	122.2	121.2	120.3	120.3	119.3	119.3	119.3	118.3	118.3	116.4
62.5°	100.7	100.7	100.7	99.7	99.7	98.8	98.8	98.8	99.7	99.7	98.8
65°	81.2	81.2	81.2	81.2	80.2	80.2	80.2	80.2	81.2	80.2	80.2
67.5°	62.6	62.6	62.6	62.6	61.6	61.6	61.6	61.6	62.6	62.6	62.6
70°	46.9	46.0	46.9	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0
72.5°	32.3	31.3	32.3	32.3	32.3	32.3	32.3	31.3	31.3	31.3	31.3
75°	19.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5	19.6	19.6	19.6
77.5°	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	10.8
80°	5.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	5.9	5.9	5.9
82.5°	2.9	2.9	2.9	3.9	3.9	3.9	2.9	2.9	2.9	2.9	2.9
85°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
87.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
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):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7
2.5°	319.7	319.7	319.7	320.7	320.7	320.7	321.7	321.7	321.7	321.7	321.7
5°	316.8	316.8	317.8	318.8	318.8	319.7	320.7	320.7	320.7	320.7	321.7
7.5°	313.9	314.9	314.9	316.8	316.8	317.8	318.8	319.7	319.7	320.7	321.7
10°	309.0	310.9	311.9	312.9	313.9	315.8	316.8	317.8	318.8	319.7	320.7
12.5°	304.1	305.1	307.0	309.0	310.0	311.9	312.9	313.9	315.8	316.8	317.8
15°	299.2	300.2	303.1	305.1	306.1	308.0	310.0	311.9	312.9	313.9	315.8
17.5°	293.3	295.3	297.3	300.2	302.1	304.1	306.1	308.0	310.0	310.9	311.9
20°	287.5	289.4	292.4	294.3	296.3	299.2	301.2	303.1	305.1	306.1	308.0
22.5°	279.7	282.6	284.5	288.5	290.4	293.3	295.3	297.3	299.2	300.2	301.2
25°	271.8	274.8	277.7	280.6	282.6	285.5	288.5	290.4	291.4	292.4	293.3
27.5°	264.0	266.0	268.9	271.8	274.8	277.7	279.7	281.6	282.6	283.6	283.6
30°	254.2	257.2	260.1	263.0	265.0	267.9	269.9	270.9	270.9	271.8	270.9
32.5°	244.5	246.4	249.3	252.3	254.2	256.2	258.1	258.1	258.1	257.2	255.2
35°	234.7	235.7	237.6	239.6	241.5	242.5	243.5	243.5	241.5	238.6	235.7
37.5°	222.9	223.9	225.9	226.9	227.8	227.8	227.8	225.9	222.9	219.0	213.2
40°	212.2	212.2	212.2	213.2	212.2	211.2	210.2	207.3	201.4	195.6	188.7
42.5°	199.5	199.5	198.5	197.5	195.6	193.6	189.7	185.8	178.9	171.1	163.3
45°	187.7	185.8	183.8	180.9	177.0	172.1	167.2	161.3	154.5	145.7	136.9
47.5°	176.0	173.1	168.2	163.3	156.4	149.6	143.7	135.9	128.1	119.3	110.5
50°	167.2	162.3	155.5	147.6	137.9	129.1	120.3	111.5	102.7	94.8	87.0
52.5°	161.3	154.5	145.7	134.0	121.2	109.5	97.8	89.0	80.2	73.3	66.5
55°	152.5	144.7	134.0	121.2	105.6	90.9	78.2	68.4	60.6	54.8	48.9
57.5°	133.0	125.2	114.4	99.7	84.1	70.4	57.7	48.9	43.0	38.1	34.2
60°	113.4	106.6	95.8	81.2	66.5	51.8	40.1	32.3	27.4	24.4	22.5
62.5°	95.8	90.9	80.2	67.5	52.8	39.1	29.3	22.5	18.6	15.6	14.7
65°	79.2	74.3	65.5	53.8	42.0	30.3	20.5	15.6	11.7	10.8	9.8
67.5°	61.6	57.7	50.8	42.0	31.3	21.5	14.7	9.8	7.8	6.8	5.9
70°	45.0	43.0	38.1	31.3	23.5	15.6	10.8	6.8	4.9	3.9	3.9
72.5°	31.3	29.3	26.4	21.5	15.6	10.8	6.8	4.9	2.9	2.9	2.0
75°	19.6	18.6	16.6	13.7	9.8	6.8	3.9	2.9	2.0	2.0	2.0
77.5°	10.8	9.8	8.8	7.8	5.9	3.9	2.9	2.0	2.0	1.0	1.0
80°	5.9	4.9	4.9	3.9	2.9	2.0	2.0	1.0	1.0	1.0	1.0
82.5°	2.9	2.9	2.9	2.0	2.0	1.0	1.0	1.0	1.0	1.0	0.0
85°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0
87.5°	1.0	1.0	1.0	1.0	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):**

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7	320.7
2.5°	321.7	321.7	321.7	322.7	322.7	322.7	322.7	322.7	321.7	322.7	322.7
5°	322.7	321.7	322.7	323.7	323.7	323.7	324.6	324.6	324.6	324.6	324.6
7.5°	322.7	322.7	322.7	323.7	324.6	324.6	325.6	325.6	325.6	325.6	326.6
10°	321.7	321.7	322.7	323.7	324.6	324.6	324.6	325.6	325.6	325.6	326.6
12.5°	318.8	319.7	320.7	321.7	323.7	323.7	323.7	324.6	324.6	324.6	324.6
15°	315.8	317.8	318.8	319.7	320.7	321.7	321.7	322.7	322.7	322.7	323.7
17.5°	312.9	313.9	314.9	316.8	317.8	317.8	318.8	318.8	318.8	319.7	319.7
20°	309.0	310.0	310.9	311.9	312.9	312.9	313.9	313.9	313.9	313.9	314.9
22.5°	303.1	303.1	304.1	305.1	305.1	306.1	306.1	307.0	307.0	307.0	307.0
25°	294.3	294.3	295.3	295.3	296.3	296.3	296.3	296.3	297.3	297.3	297.3
27.5°	283.6	283.6	283.6	283.6	283.6	284.5	284.5	284.5	284.5	284.5	284.5
30°	269.9	269.9	268.9	268.9	268.9	267.9	267.9	268.9	268.9	267.9	268.9
32.5°	253.3	251.3	249.3	249.3	248.4	248.4	247.4	247.4	247.4	247.4	247.4
35°	232.7	228.8	226.9	224.9	224.9	223.9	222.9	222.9	222.9	222.9	222.9
37.5°	208.3	203.4	200.5	198.5	196.5	196.5	195.6	195.6	195.6	194.6	195.6
40°	181.9	176.0	172.1	169.2	167.2	166.2	166.2	166.2	165.2	165.2	165.2
42.5°	154.5	147.6	142.8	139.8	137.9	136.9	136.9	136.9	135.9	135.9	135.9
45°	128.1	120.3	115.4	112.4	110.5	110.5	109.5	109.5	108.5	108.5	109.5
47.5°	102.7	95.8	90.9	88.0	87.0	86.0	85.1	85.1	85.1	85.1	85.1
50°	80.2	74.3	70.4	68.4	66.5	66.5	65.5	65.5	65.5	65.5	65.5
52.5°	60.6	55.7	52.8	51.8	50.8	49.9	49.9	49.9	49.9	49.9	48.9
55°	45.0	41.1	39.1	38.1	38.1	37.2	37.2	37.2	37.2	37.2	37.2
57.5°	31.3	30.3	28.4	28.4	27.4	27.4	27.4	26.4	26.4	26.4	26.4
60°	21.5	20.5	19.6	19.6	18.6	18.6	18.6	18.6	18.6	17.6	17.6
62.5°	13.7	13.7	13.7	12.7	12.7	12.7	11.7	12.7	11.7	11.7	11.7
65°	8.8	8.8	8.8	7.8	7.8	7.8	7.8	7.8	7.8	6.8	6.8
67.5°	5.9	4.9	4.9	4.9	4.9	3.9	3.9	3.9	3.9	3.9	3.9
70°	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.0	2.9	2.0	2.0
72.5°	2.0	2.0	2.0	2.0	1.0	1.0	2.0	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	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0
80°	1.0	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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CATALOG NUMBER: EL406927-TL409WW

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	320.7	320.7	320.7	320.7
2.5°	322.7	322.7	322.7	321.7
5°	324.6	324.6	324.6	323.7
7.5°	327.6	326.6	326.6	325.6
10°	326.6	326.6	326.6	325.6
12.5°	325.6	325.6	325.6	324.6
15°	324.6	323.7	323.7	322.7
17.5°	320.7	320.7	320.7	319.7
20°	315.8	315.8	315.8	313.9
22.5°	308.0	308.0	308.0	307.0
25°	298.2	298.2	298.2	297.3
27.5°	285.5	285.5	285.5	284.5
30°	268.9	268.9	268.9	267.9
32.5°	248.4	248.4	248.4	247.4
35°	222.9	223.9	223.9	222.9
37.5°	195.6	195.6	195.6	194.6
40°	165.2	165.2	165.2	164.3
42.5°	135.9	135.9	135.9	134.9
45°	108.5	108.5	108.5	107.6
47.5°	84.1	84.1	84.1	84.1
50°	64.5	64.5	64.5	64.5
52.5°	48.9	48.9	48.9	48.9
55°	36.2	36.2	36.2	36.2
57.5°	26.4	26.4	25.4	26.4
60°	17.6	17.6	17.6	17.6
62.5°	11.7	11.7	11.7	11.7
65°	6.8	6.8	6.8	6.8
67.5°	3.9	3.9	3.9	3.9
70°	2.9	2.0	2.0	2.9
72.5°	1.0	1.0	1.0	1.0
75°	1.0	1.0	1.0	1.0
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)