

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: P123731

Luminaire Tested: **EL406935-TL409WW**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P123731
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: EL406935-TL409WW
Description: HALO 4-INCH RECESSED LED DOWNLIGHT
WALL-WASH WITH SEMI-SPECULAR REFLECTOR AND WHITE TRIM RING
Light Source: (1)SURFACE MOUNT LED, 3500K CCT, 90CRI
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 710.0 lumens
Efficiency: N/A
Efficacy: 54.6 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

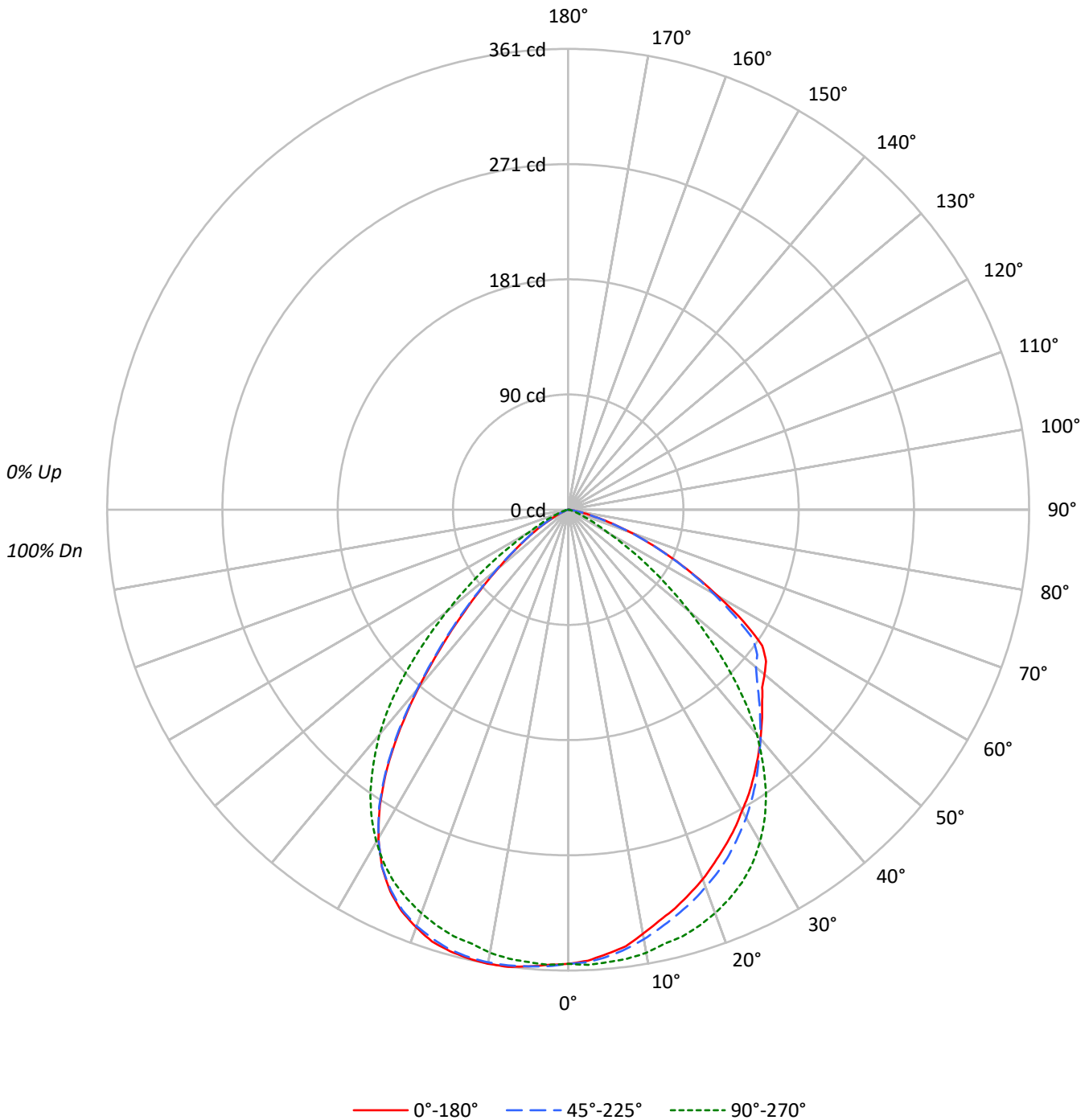
Input Watts (W): 13
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



TEST NUMBER: P123731

CATALOG NUMBER: EL406935-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	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°	57321	57321	57321
5°	56489	57540	58073
10°	55195	57665	59088
15°	53922	57708	59710
20°	52822	57656	59696
25°	51674	57274	58625
30°	50655	55901	55287
35°	49915	53121	48637
40°	49275	48370	38318
45°	48939	40782	27181
50°	50302	31003	17945
55°	52102	21318	11263
60°	43691	11535	6283
65°	34308	6633	2897
70°	24541	3580	1554
75°	13507	2054	685
80°	6030	1021	0
85°	4067	0	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	33.8	4.8
10°-20°	96.7	13.6
20°-30°	144.5	20.3
30°-40°	158.9	22.4
40°-50°	130.9	18.4
50°-60°	89.7	12.6
60°-70°	42.7	6.0
70°-80°	11.7	1.6
80°-90°	1.2	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°	275.0	38.7
0°-40°	433.8	61.1
0°-60°	654.5	92.2
0°-90°	710.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	710.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	356	356	356	356	356	
5°	349	352	356	359	359	33
15°	323	329	346	357	358	91
25°	291	298	322	329	330	134
35°	254	257	270	248	247	159
45°	215	212	179	123	119	167
55°	186	177	76	41	40	159
65°	90	89	17	9	8	90
75°	22	22	3	1	1	26
85°	2	2	0	0	0	3
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°	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8
2.5°	353.6	353.6	353.6	353.6	353.6	353.6	353.6	353.6	352.5	354.7	354.7
5°	349.3	348.2	349.3	349.3	349.3	349.3	349.3	349.3	350.4	351.5	351.5
7.5°	345.0	343.9	343.9	343.9	343.9	346.0	345.0	346.0	346.0	347.1	347.1
10°	337.4	337.4	337.4	337.4	338.4	338.4	338.4	339.5	340.6	341.7	341.7
12.5°	329.8	329.8	329.8	329.8	330.9	331.9	331.9	333.0	334.1	335.2	336.3
15°	323.3	323.3	323.3	323.3	323.3	324.3	325.4	326.5	327.6	328.7	329.8
17.5°	315.7	315.7	315.7	316.7	316.7	316.7	317.8	318.9	320.0	322.2	323.3
20°	308.1	308.1	308.1	308.1	309.2	309.2	310.2	311.3	313.5	314.6	316.7
22.5°	299.4	299.4	299.4	299.4	300.5	301.6	301.6	303.7	304.8	307.0	309.2
25°	290.7	290.7	290.7	290.7	291.8	291.8	292.9	294.0	296.1	298.3	300.5
27.5°	282.0	282.0	282.0	282.0	282.0	283.1	284.2	285.3	286.4	288.5	289.6
30°	272.3	272.3	273.4	273.4	273.4	274.4	274.4	275.5	276.6	278.8	279.9
32.5°	263.6	263.6	263.6	262.5	263.6	263.6	264.7	265.8	265.8	267.9	269.0
35°	253.8	253.8	253.8	253.8	253.8	253.8	253.8	253.8	256.0	257.1	258.2
37.5°	244.1	243.0	244.1	243.0	243.0	244.1	243.0	244.1	245.2	245.2	246.2
40°	234.3	234.3	234.3	233.2	233.2	233.2	233.2	234.3	233.2	234.3	234.3
42.5°	224.5	224.5	223.5	223.5	223.5	223.5	222.4	222.4	222.4	222.4	222.4
45°	214.8	214.8	214.8	213.7	213.7	212.6	212.6	211.5	211.5	211.5	209.4
47.5°	206.1	206.1	206.1	205.0	203.9	202.8	202.8	201.8	200.7	200.7	198.5
50°	200.7	199.6	199.6	198.5	197.4	196.3	195.3	195.3	193.1	192.0	189.8
52.5°	195.3	195.3	194.2	193.1	192.0	190.9	189.8	188.7	188.7	186.6	183.3
55°	185.5	185.5	184.4	182.2	181.2	180.1	180.1	179.0	179.0	176.8	173.6
57.5°	162.7	162.7	161.6	160.5	159.5	158.4	157.3	156.2	156.2	154.0	151.9
60°	135.6	135.6	134.5	133.4	133.4	132.3	132.3	132.3	131.3	131.3	129.1
62.5°	111.7	111.7	111.7	110.6	110.6	109.6	109.6	109.6	110.6	110.6	109.6
65°	90.0	90.0	90.0	90.0	88.9	88.9	88.9	88.9	90.0	88.9	88.9
67.5°	69.4	69.4	69.4	69.4	68.3	68.3	68.3	68.3	69.4	69.4	69.4
70°	52.1	51.0	52.1	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0
72.5°	35.8	34.7	35.8	35.8	35.8	35.8	35.8	34.7	34.7	34.7	34.7
75°	21.7	22.8	22.8	22.8	22.8	22.8	22.8	22.8	21.7	21.7	21.7
77.5°	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9
80°	6.5	7.6	7.6	7.6	7.6	7.6	7.6	7.6	6.5	6.5	6.5
82.5°	3.3	3.3	3.3	4.3	4.3	4.3	3.3	3.3	3.3	3.3	3.3
85°	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
87.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
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°	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8
2.5°	354.7	354.7	354.7	355.8	355.8	355.8	356.9	356.9	356.9	356.9	356.9
5°	351.5	351.5	352.5	353.6	353.6	354.7	355.8	355.8	355.8	355.8	356.9
7.5°	348.2	349.3	349.3	351.5	351.5	352.5	353.6	354.7	354.7	355.8	356.9
10°	342.8	345.0	346.0	347.1	348.2	350.4	351.5	352.5	353.6	354.7	355.8
12.5°	337.4	338.4	340.6	342.8	343.9	346.0	347.1	348.2	350.4	351.5	352.5
15°	331.9	333.0	336.3	338.4	339.5	341.7	343.9	346.0	347.1	348.2	350.4
17.5°	325.4	327.6	329.8	333.0	335.2	337.4	339.5	341.7	343.9	345.0	346.0
20°	318.9	321.1	324.3	326.5	328.7	331.9	334.1	336.3	338.4	339.5	341.7
22.5°	310.2	313.5	315.7	320.0	322.2	325.4	327.6	329.8	331.9	333.0	334.1
25°	301.6	304.8	308.1	311.3	313.5	316.7	320.0	322.2	323.3	324.3	325.4
27.5°	292.9	295.1	298.3	301.6	304.8	308.1	310.2	312.4	313.5	314.6	314.6
30°	282.0	285.3	288.5	291.8	294.0	297.2	299.4	300.5	300.5	301.6	300.5
32.5°	271.2	273.4	276.6	279.9	282.0	284.2	286.4	286.4	286.4	285.3	283.1
35°	260.3	261.4	263.6	265.8	267.9	269.0	270.1	270.1	267.9	264.7	261.4
37.5°	247.3	248.4	250.6	251.7	252.7	252.7	252.7	250.6	247.3	243.0	236.5
40°	235.4	235.4	235.4	236.5	235.4	234.3	233.2	230.0	223.5	217.0	209.4
42.5°	221.3	221.3	220.2	219.1	217.0	214.8	210.4	206.1	198.5	189.8	181.2
45°	208.3	206.1	203.9	200.7	196.3	190.9	185.5	179.0	171.4	161.6	151.9
47.5°	195.3	192.0	186.6	181.2	173.6	166.0	159.5	150.8	142.1	132.3	122.6
50°	185.5	180.1	172.5	163.8	153.0	143.2	133.4	123.7	113.9	105.2	96.5
52.5°	179.0	171.4	161.6	148.6	134.5	121.5	108.5	98.7	88.9	81.4	73.8
55°	169.2	160.5	148.6	134.5	117.2	100.9	86.8	75.9	67.3	60.7	54.2
57.5°	147.5	138.8	126.9	110.6	93.3	78.1	64.0	54.2	47.7	42.3	38.0
60°	125.8	118.2	106.3	90.0	73.8	57.5	44.5	35.8	30.4	27.1	24.9
62.5°	106.3	100.9	88.9	74.8	58.6	43.4	32.5	24.9	20.6	17.4	16.3
65°	87.9	82.4	72.7	59.7	46.6	33.6	22.8	17.4	13.0	11.9	10.8
67.5°	68.3	64.0	56.4	46.6	34.7	23.9	16.3	10.8	8.7	7.6	6.5
70°	49.9	47.7	42.3	34.7	26.0	17.4	11.9	7.6	5.4	4.3	4.3
72.5°	34.7	32.5	29.3	23.9	17.4	11.9	7.6	5.4	3.3	3.3	2.2
75°	21.7	20.6	18.4	15.2	10.8	7.6	4.3	3.3	2.2	2.2	2.2
77.5°	11.9	10.8	9.8	8.7	6.5	4.3	3.3	2.2	2.2	1.1	1.1
80°	6.5	5.4	5.4	4.3	3.3	2.2	2.2	1.1	1.1	1.1	1.1
82.5°	3.3	3.3	3.3	2.2	2.2	1.1	1.1	1.1	1.1	1.1	0.0
85°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0
87.5°	1.1	1.1	1.1	1.1	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°	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8	355.8
2.5°	356.9	356.9	356.9	358.0	358.0	358.0	358.0	358.0	356.9	358.0	358.0
5°	358.0	356.9	358.0	359.1	359.1	359.1	360.1	360.1	360.1	360.1	360.1
7.5°	358.0	358.0	358.0	359.1	360.1	360.1	361.2	361.2	361.2	361.2	362.3
10°	356.9	356.9	358.0	359.1	360.1	360.1	360.1	361.2	361.2	361.2	362.3
12.5°	353.6	354.7	355.8	356.9	359.1	359.1	359.1	360.1	360.1	360.1	360.1
15°	350.4	352.5	353.6	354.7	355.8	356.9	356.9	358.0	358.0	358.0	359.1
17.5°	347.1	348.2	349.3	351.5	352.5	352.5	353.6	353.6	353.6	354.7	354.7
20°	342.8	343.9	345.0	346.0	347.1	347.1	348.2	348.2	348.2	348.2	349.3
22.5°	336.3	336.3	337.4	338.4	338.4	339.5	339.5	340.6	340.6	340.6	340.6
25°	326.5	326.5	327.6	327.6	328.7	328.7	328.7	328.7	329.8	329.8	329.8
27.5°	314.6	314.6	314.6	314.6	314.6	315.7	315.7	315.7	315.7	315.7	315.7
30°	299.4	299.4	298.3	298.3	298.3	297.2	297.2	298.3	298.3	297.2	298.3
32.5°	281.0	278.8	276.6	276.6	275.5	275.5	274.4	274.4	274.4	274.4	274.4
35°	258.2	253.8	251.7	249.5	249.5	248.4	247.3	247.3	247.3	247.3	247.3
37.5°	231.1	225.6	222.4	220.2	218.0	218.0	217.0	217.0	217.0	215.9	217.0
40°	201.8	195.3	190.9	187.7	185.5	184.4	184.4	184.4	183.3	183.3	183.3
42.5°	171.4	163.8	158.4	155.1	153.0	151.9	151.9	151.9	150.8	150.8	150.8
45°	142.1	133.4	128.0	124.7	122.6	122.6	121.5	121.5	120.4	120.4	121.5
47.5°	113.9	106.3	100.9	97.6	96.5	95.5	94.4	94.4	94.4	94.4	94.4
50°	88.9	82.4	78.1	75.9	73.8	73.8	72.7	72.7	72.7	72.7	72.7
52.5°	67.3	61.8	58.6	57.5	56.4	55.3	55.3	55.3	55.3	55.3	54.2
55°	49.9	45.6	43.4	42.3	42.3	41.2	41.2	41.2	41.2	41.2	41.2
57.5°	34.7	33.6	31.5	31.5	30.4	30.4	30.4	29.3	29.3	29.3	29.3
60°	23.9	22.8	21.7	21.7	20.6	20.6	20.6	20.6	20.6	19.5	19.5
62.5°	15.2	15.2	15.2	14.1	14.1	14.1	13.0	14.1	13.0	13.0	13.0
65°	9.8	9.8	9.8	8.7	8.7	8.7	8.7	8.7	8.7	7.6	7.6
67.5°	6.5	5.4	5.4	5.4	5.4	4.3	4.3	4.3	4.3	4.3	4.3
70°	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.2	3.3	2.2	2.2
72.5°	2.2	2.2	2.2	2.2	1.1	1.1	2.2	1.1	1.1	1.1	1.1
75°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
77.5°	1.1	1.1	1.1	1.1	0.0	0.0	0.0	1.1	0.0	0.0	1.1
80°	1.1	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: EL406935-TL409WW

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	355.8	355.8	355.8	355.8
2.5°	358.0	358.0	358.0	356.9
5°	360.1	360.1	360.1	359.1
7.5°	363.4	362.3	362.3	361.2
10°	362.3	362.3	362.3	361.2
12.5°	361.2	361.2	361.2	360.1
15°	360.1	359.1	359.1	358.0
17.5°	355.8	355.8	355.8	354.7
20°	350.4	350.4	350.4	348.2
22.5°	341.7	341.7	341.7	340.6
25°	330.9	330.9	330.9	329.8
27.5°	316.7	316.7	316.7	315.7
30°	298.3	298.3	298.3	297.2
32.5°	275.5	275.5	275.5	274.4
35°	247.3	248.4	248.4	247.3
37.5°	217.0	217.0	217.0	215.9
40°	183.3	183.3	183.3	182.2
42.5°	150.8	150.8	150.8	149.7
45°	120.4	120.4	120.4	119.3
47.5°	93.3	93.3	93.3	93.3
50°	71.6	71.6	71.6	71.6
52.5°	54.2	54.2	54.2	54.2
55°	40.1	40.1	40.1	40.1
57.5°	29.3	29.3	28.2	29.3
60°	19.5	19.5	19.5	19.5
62.5°	13.0	13.0	13.0	13.0
65°	7.6	7.6	7.6	7.6
67.5°	4.3	4.3	4.3	4.3
70°	3.3	2.2	2.2	3.3
72.5°	1.1	1.1	1.1	1.1
75°	1.1	1.1	1.1	1.1
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)