

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: P130208

Luminaire Tested: **HL612ICAT - HLM6940 - HL6NFL - 455SN**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P130208
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P33469)
Test Lab: INNOVATION CENTER-P3
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: HL612ICAT - HLM6940 - HL6NFL - 455SN
Description: HALO ALLSLOPE 6" 21W, Satin Nickel Reflector, Satin Nickel Metal Trim Ring using 25 Degree Optic at a 6-12 Pitch
Light Source: (1) HIGH LUMEN LED 90CRI / 4000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1624.7 lumens
Efficiency: N/A
Efficacy: 85.1 lumens/watt
Spacing Criteria (0/90/45): 1.85 / 0.72 / 1.15
Luminous Opening: Vertical Cylinder (Dia: 0.48' x H: 0.1')
CIE Type: Direct

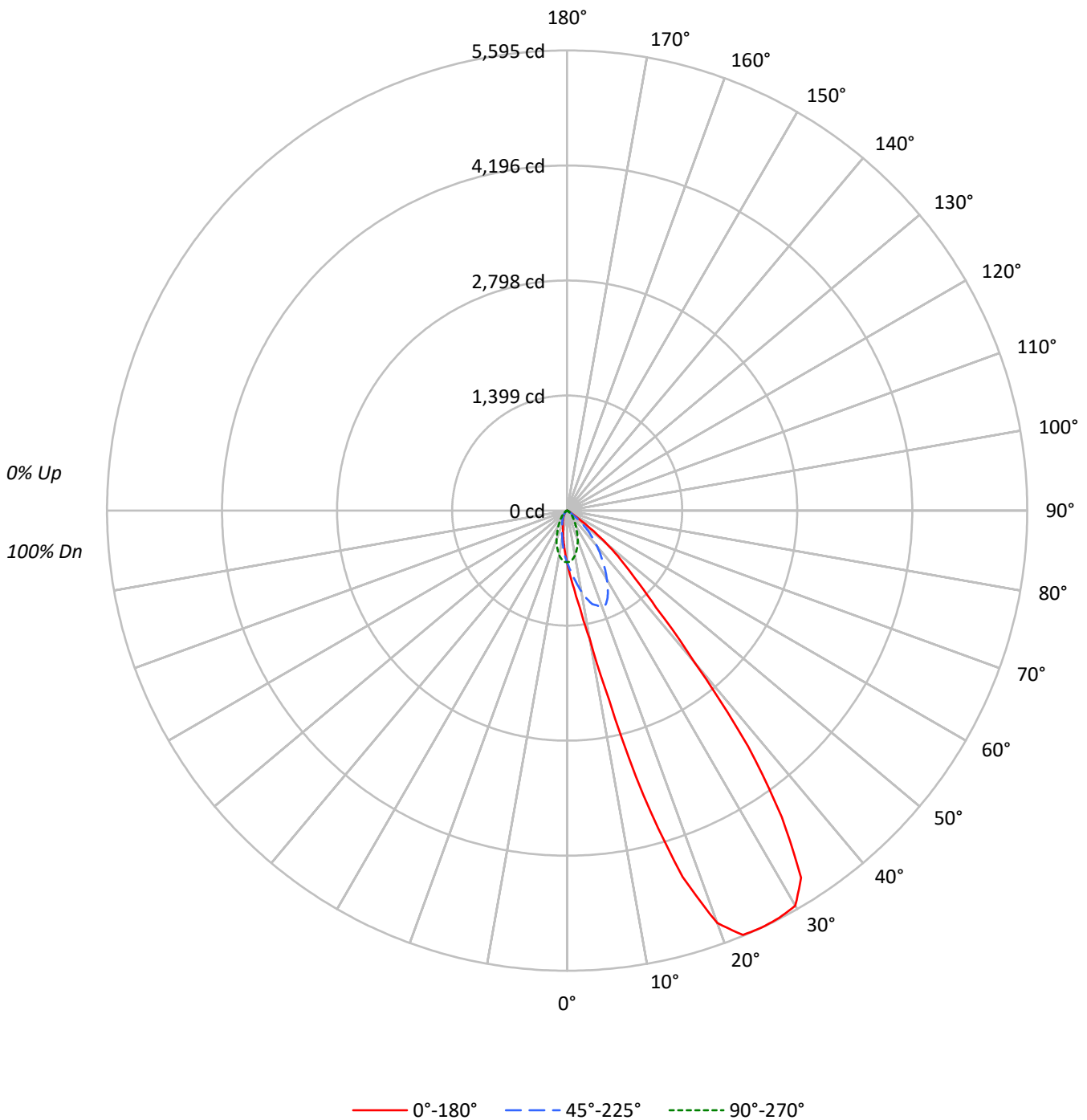
Input Watts (W): 19.1
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	109	107	104	110	107	105	102	103	101	99	99	98	96	96	95	94	92					92			
2	106	100	96	92	104	99	94	91	95	92	89	92	89	87	89	87	85	83					83			
3	99	92	86	82	97	91	85	81	88	83	80	85	82	78	83	80	77	75					75			
4	93	84	78	73	91	83	77	73	81	76	72	79	75	71	77	73	70	68					68			
5	87	78	71	66	86	77	70	66	75	69	65	73	68	64	71	67	64	62					62			
6	82	72	65	60	80	71	64	59	69	63	59	68	62	59	66	62	58	56					56			
7	77	66	59	54	75	65	59	54	64	58	54	63	57	53	62	57	53	52					52			
8	72	61	54	50	71	61	54	49	59	53	49	58	53	49	57	52	49	47					47			
9	68	57	50	45	67	56	50	45	55	49	45	54	49	45	53	48	45	43					43			
10	64	53	46	42	63	52	46	42	51	46	41	51	45	41	50	45	41	40					40			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	37474	37474	37474
5°	55495	35650	24875
10°	92013	31914	16380
15°	206919	26941	11561
20°	309008	21714	8566
25°	327857	16426	6704
30°	331504	12334	5396
35°	279542	9302	4227
40°	153743	6907	3288
45°	77538	4815	2294
50°	44581	3216	1453
55°	10705	2203	777
60°	3442	1545	564
65°	2240	927	387
70°	1211	434	262
75°	394	301	197
80°	123	233	123
85°	0	288	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	62.8	3.9
10°-20°	267.1	16.4
20°-30°	530.1	32.6
30°-40°	477.1	29.4
40°-50°	216.4	13.3
50°-60°	53.9	3.3
60°-70°	12.9	0.8
70°-80°	3.2	0.2
80°-90°	1.2	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°	860.0	52.9
0°-40°	1337.1	82.3
0°-60°	1607.4	98.9
0°-90°	1624.7	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1624.7	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	628	628	628	628	628	
5°	948	802	609	482	425	110
15°	3587	1178	467	246	200	1056
25°	5595	1164	280	136	114	2571
35°	4550	755	151	84	69	2699
45°	1163	382	72	44	34	982
55°	142	52	29	17	10	195
65°	25	20	10	6	4	25
75°	3	3	3	3	2	5
85°	0	2	2	1	0	0
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°	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8
2.5°	775.7	737.0	754.2	737.8	739.6	737.8	725.8	734.4	716.3	708.6	698.3
5°	947.7	898.6	918.4	890.9	880.6	878.0	850.5	844.5	818.7	801.5	776.5
7.5°	1191.9	1143.7	1150.6	1117.1	1081.0	1063.8	1016.5	988.1	936.5	893.5	853.1
10°	1589.2	1504.9	1529.8	1436.1	1363.0	1300.2	1220.3	1156.6	1069.8	998.4	929.6
12.5°	2348.5	2155.9	2121.5	1952.1	1799.9	1632.2	1466.2	1356.1	1209.9	1095.6	995.0
15°	3586.8	3304.8	3236.0	2886.8	2516.2	2127.5	1784.4	1569.4	1338.9	1178.1	1042.3
17.5°	4669.5	4378.8	4290.3	3824.2	3431.2	2837.0	2201.5	1792.1	1455.9	1208.2	1064.6
20°	5335.1	5183.8	5172.6	4574.9	4014.2	3393.3	2571.2	1965.8	1490.3	1252.9	1054.3
22.5°	5584.5	5497.6	5453.8	5016.9	4439.9	3689.2	2769.0	2038.1	1529.8	1231.4	1014.7
25°	5594.8	5551.8	5570.7	5157.1	4562.0	3751.9	2757.8	1974.4	1460.2	1164.4	949.4
27.5°	5582.8	5538.9	5548.4	5102.1	4456.2	3576.5	2557.5	1807.6	1347.5	1070.6	873.7
30°	5547.5	5485.6	5391.9	4836.3	4120.0	3162.9	2173.1	1584.0	1207.4	967.4	798.0
32.5°	5293.8	5223.3	4998.0	4308.3	3524.1	2566.1	1769.8	1355.3	1056.0	860.8	714.6
35°	4550.0	4511.3	4207.7	3497.4	2746.7	1958.1	1455.0	1157.5	917.6	755.0	629.5
37.5°	3613.5	3574.8	3233.4	2624.6	1970.1	1519.5	1197.0	980.3	789.4	659.6	549.5
40°	2413.0	2459.4	2242.7	1808.5	1467.1	1185.0	977.8	829.0	673.3	559.8	464.4
42.5°	1599.5	1605.5	1523.0	1304.5	1114.5	942.5	795.5	686.2	560.7	467.8	382.7
45°	1162.6	1160.9	1114.5	975.2	868.5	754.2	651.0	563.3	463.5	381.8	308.7
47.5°	878.0	879.7	852.2	763.6	701.7	608.8	525.4	449.8	366.3	296.7	234.8
50°	632.1	637.2	616.6	553.8	502.2	432.6	362.9	305.3	243.4	193.5	147.1
52.5°	352.6	365.5	348.3	313.0	276.0	232.2	190.9	160.8	123.8	98.0	77.4
55°	141.9	151.4	146.2	129.0	114.4	96.3	85.1	72.2	59.3	52.5	48.2
57.5°	61.1	60.2	60.2	55.0	52.5	49.0	45.6	44.7	41.3	40.4	38.7
60°	42.1	42.1	42.1	40.4	39.6	38.7	37.0	36.1	34.4	32.7	31.0
62.5°	32.7	32.7	32.7	31.8	31.0	31.0	29.2	29.2	27.5	25.8	24.1
65°	24.9	24.9	25.8	24.9	24.1	24.1	23.2	22.4	20.6	19.8	18.1
67.5°	18.1	18.1	18.1	18.1	18.1	17.2	16.3	15.5	14.6	13.8	13.8
70°	12.0	12.0	12.0	12.0	12.0	11.2	11.2	10.3	10.3	9.5	8.6
72.5°	7.7	7.7	7.7	6.9	6.9	6.9	6.9	6.0	6.0	5.2	5.2
75°	3.4	3.4	3.4	3.4	3.4	2.6	3.4	2.6	2.6	2.6	2.6
77.5°	0.9	0.9	0.9	0.9	0.9	1.7	1.7	1.7	1.7	1.7	1.7
80°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.7	1.7	1.7	1.7
82.5°	0.9	0.0	0.9	0.9	0.9	0.9	0.9	1.7	1.7	1.7	1.7
85°	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	1.7	1.7	1.7
87.5°	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	1.7	1.7
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°	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8
2.5°	695.7	680.2	676.8	658.7	647.5	639.8	634.6	624.3	603.7	600.2	594.2
5°	763.6	731.8	717.2	687.1	663.9	645.8	629.5	608.8	577.0	563.3	552.1
7.5°	825.5	759.3	748.2	705.2	670.8	639.8	613.1	583.9	544.3	526.3	506.5
10°	877.1	809.2	767.1	711.2	665.6	625.2	589.1	551.2	507.4	481.6	457.5
12.5°	916.7	829.0	769.7	701.7	645.8	595.9	555.5	509.1	464.4	434.3	408.5
15°	937.3	830.7	758.5	695.7	616.6	560.7	514.2	467.0	417.9	388.7	356.9
17.5°	934.8	813.5	732.7	647.5	577.0	517.7	468.7	424.0	373.2	337.1	307.9
20°	910.7	784.3	697.4	607.1	533.2	469.5	423.1	374.9	324.2	291.5	264.0
22.5°	867.7	741.3	651.0	558.1	486.7	424.0	373.2	326.8	279.5	252.8	226.2
25°	814.4	688.8	595.9	504.8	433.4	373.2	325.1	280.3	239.9	215.8	194.3
27.5°	750.7	628.6	536.6	454.1	383.5	325.1	278.6	241.6	205.5	186.6	167.7
30°	681.1	563.3	477.3	395.6	330.2	278.6	238.2	206.4	177.1	156.5	146.2
32.5°	606.3	496.2	418.8	342.3	282.1	237.3	202.9	176.3	152.2	138.5	127.3
35°	530.6	430.0	357.7	289.8	239.9	199.5	172.8	151.4	130.7	120.4	110.1
37.5°	455.8	364.6	301.0	243.4	200.4	169.4	147.1	128.1	111.8	104.1	96.3
40°	381.0	302.7	247.7	200.4	165.1	141.0	123.0	108.4	95.5	89.4	83.4
42.5°	310.4	246.8	201.2	168.5	137.6	117.8	103.2	91.2	80.0	74.8	69.7
45°	249.4	196.9	161.7	131.6	110.1	92.9	81.7	72.2	64.5	60.2	57.6
47.5°	184.9	144.5	116.1	94.6	79.1	67.9	61.9	55.9	51.6	49.9	47.3
50°	114.4	89.4	75.7	62.8	55.9	51.6	49.0	45.6	42.1	40.4	37.8
52.5°	65.4	55.0	50.7	47.3	44.7	43.0	40.4	37.8	33.5	31.8	30.1
55°	44.7	42.1	41.3	38.7	36.1	33.5	31.8	29.2	26.7	26.7	24.9
57.5°	37.0	34.4	33.5	30.1	28.4	26.7	25.8	24.1	22.4	20.6	19.8
60°	30.1	27.5	26.7	24.9	23.2	21.5	20.6	18.9	17.2	16.3	15.5
62.5°	23.2	21.5	20.6	19.8	18.1	16.3	15.5	14.6	12.9	12.0	11.2
65°	18.1	16.3	15.5	14.6	12.9	12.0	11.2	10.3	9.5	8.6	7.7
67.5°	12.9	11.2	11.2	10.3	9.5	8.6	7.7	6.9	6.0	6.0	5.2
70°	8.6	7.7	6.9	6.0	6.0	5.2	4.3	4.3	4.3	4.3	4.3
72.5°	5.2	4.3	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
75°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
77.5°	1.7	1.7	2.6	2.6	2.6	2.6	2.6	2.6	1.7	2.6	2.6
80°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
82.5°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
85°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
87.5°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
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°	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8
2.5°	583.9	581.3	569.3	566.7	555.5	563.3	552.9	536.6	534.0	538.3	528.9
5°	531.4	521.1	506.5	497.9	484.1	482.4	473.8	451.5	448.9	444.6	436.0
7.5°	479.9	467.8	446.3	430.0	418.8	411.9	401.6	381.0	373.2	368.9	357.7
10°	430.0	412.8	387.0	373.2	354.3	344.8	333.7	314.7	307.0	304.4	291.5
12.5°	379.2	356.9	331.1	317.3	297.5	288.9	278.6	263.1	256.3	250.2	244.2
15°	326.8	306.1	282.1	269.2	253.7	245.9	237.3	221.9	215.8	212.4	210.7
17.5°	281.2	261.4	239.1	229.6	215.0	207.2	201.2	189.2	184.0	180.6	177.1
20°	241.6	224.4	205.5	196.9	184.9	179.7	172.8	163.4	160.0	157.4	153.9
22.5°	206.4	191.8	177.1	170.3	160.8	156.5	150.5	143.6	140.2	137.6	135.0
25°	177.1	166.0	154.8	148.8	140.2	135.9	131.6	125.6	122.1	121.3	118.7
27.5°	153.9	145.3	135.9	129.9	123.0	119.5	116.1	110.9	109.2	107.5	104.9
30°	135.0	127.3	118.7	114.4	109.2	106.6	103.2	99.8	97.2	98.0	94.6
32.5°	117.8	111.8	104.9	102.3	97.2	95.5	92.9	88.6	86.0	85.1	83.4
35°	103.2	98.0	92.9	91.2	86.9	84.3	81.7	78.3	77.4	74.8	73.1
37.5°	90.3	86.0	81.7	80.0	76.5	73.1	71.4	67.1	65.4	64.5	63.6
40°	78.3	74.8	69.7	67.9	64.5	62.8	60.2	57.6	55.9	55.9	54.2
42.5°	65.4	62.8	58.5	57.6	54.2	53.3	50.7	49.0	47.3	46.4	45.6
45°	54.2	52.5	49.0	48.2	45.6	43.9	43.0	39.6	37.8	37.0	36.1
47.5°	44.7	43.0	38.7	37.8	37.0	34.4	32.7	31.8	30.1	29.2	29.2
50°	35.3	33.5	31.0	31.0	29.2	27.5	26.7	24.9	24.1	23.2	22.4
52.5°	28.4	27.5	24.9	24.9	23.2	22.4	20.6	19.8	18.1	18.1	17.2
55°	23.2	21.5	19.8	18.9	18.1	17.2	15.5	14.6	13.8	12.9	12.0
57.5°	18.1	17.2	15.5	14.6	13.8	12.9	11.2	10.3	9.5	9.5	8.6
60°	13.8	12.9	11.2	11.2	9.5	8.6	8.6	7.7	7.7	7.7	6.9
62.5°	10.3	9.5	8.6	7.7	6.9	6.9	6.9	6.9	6.0	6.0	6.0
65°	6.9	6.9	6.0	6.0	6.0	6.0	6.0	5.2	5.2	5.2	5.2
67.5°	5.2	5.2	5.2	5.2	5.2	4.3	4.3	4.3	4.3	4.3	4.3
70°	4.3	4.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.6
72.5°	3.4	3.4	3.4	3.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6
75°	2.6	2.6	2.6	2.6	2.6	2.6	1.7	1.7	1.7	1.7	1.7
77.5°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.9
80°	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9
82.5°	1.7	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9
85°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.9
87.5°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	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):

	165°	170°	175°	180°
0°	627.8	627.8	627.8	627.8
2.5°	526.3	533.2	524.6	517.7
5°	436.9	440.3	431.7	424.8
7.5°	356.9	357.7	350.0	344.0
10°	294.1	293.2	287.2	282.9
12.5°	244.2	243.4	238.2	234.8
15°	204.7	205.5	202.1	200.4
17.5°	176.3	176.3	172.8	172.0
20°	152.2	153.1	150.5	147.9
22.5°	134.2	134.2	132.4	129.9
25°	117.8	117.8	116.1	114.4
27.5°	104.9	105.8	104.1	101.5
30°	93.7	93.7	92.0	90.3
32.5°	82.6	82.6	81.7	80.0
35°	71.4	72.2	70.5	68.8
37.5°	62.8	62.8	61.9	60.2
40°	53.3	54.2	53.3	51.6
42.5°	44.7	44.7	44.7	43.9
45°	35.3	36.1	35.3	34.4
47.5°	28.4	28.4	28.4	27.5
50°	21.5	22.4	21.5	20.6
52.5°	16.3	16.3	15.5	15.5
55°	12.0	11.2	11.2	10.3
57.5°	8.6	8.6	8.6	7.7
60°	6.9	6.9	6.9	6.9
62.5°	6.0	6.0	6.0	6.0
65°	5.2	5.2	5.2	4.3
67.5°	3.4	3.4	3.4	3.4
70°	2.6	2.6	2.6	2.6
72.5°	2.6	2.6	1.7	1.7
75°	1.7	1.7	1.7	1.7
77.5°	0.9	0.9	0.9	0.9
80°	0.9	0.9	0.9	0.9
82.5°	0.9	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)