

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: P130209

Luminaire Tested: **HL612ICAT - HLM6930 - HL6NFL - 455TBZ**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P130209
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P33470)
Test Lab: INNOVATION CENTER-P3
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: HL612ICAT - HLM6930 - HL6NFL - 455TBZ
Description: HALO ALLSLOPE 6" 21W, Tuscan Bronze Reflector, Tuscan Bronze Metal Trim Ring using 25 Degree Optic at a 6-12 Pitch
Light Source: (1) HIGH LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1438.9 lumens
Efficiency: N/A
Efficacy: 75.3 lumens/watt
Spacing Criteria (0/90/45): 1.88 / 0.71 / 1.15
Luminous Opening: Vertical Cylinder (Dia: 0.48' x H: 0.1')
CIE Type: Direct

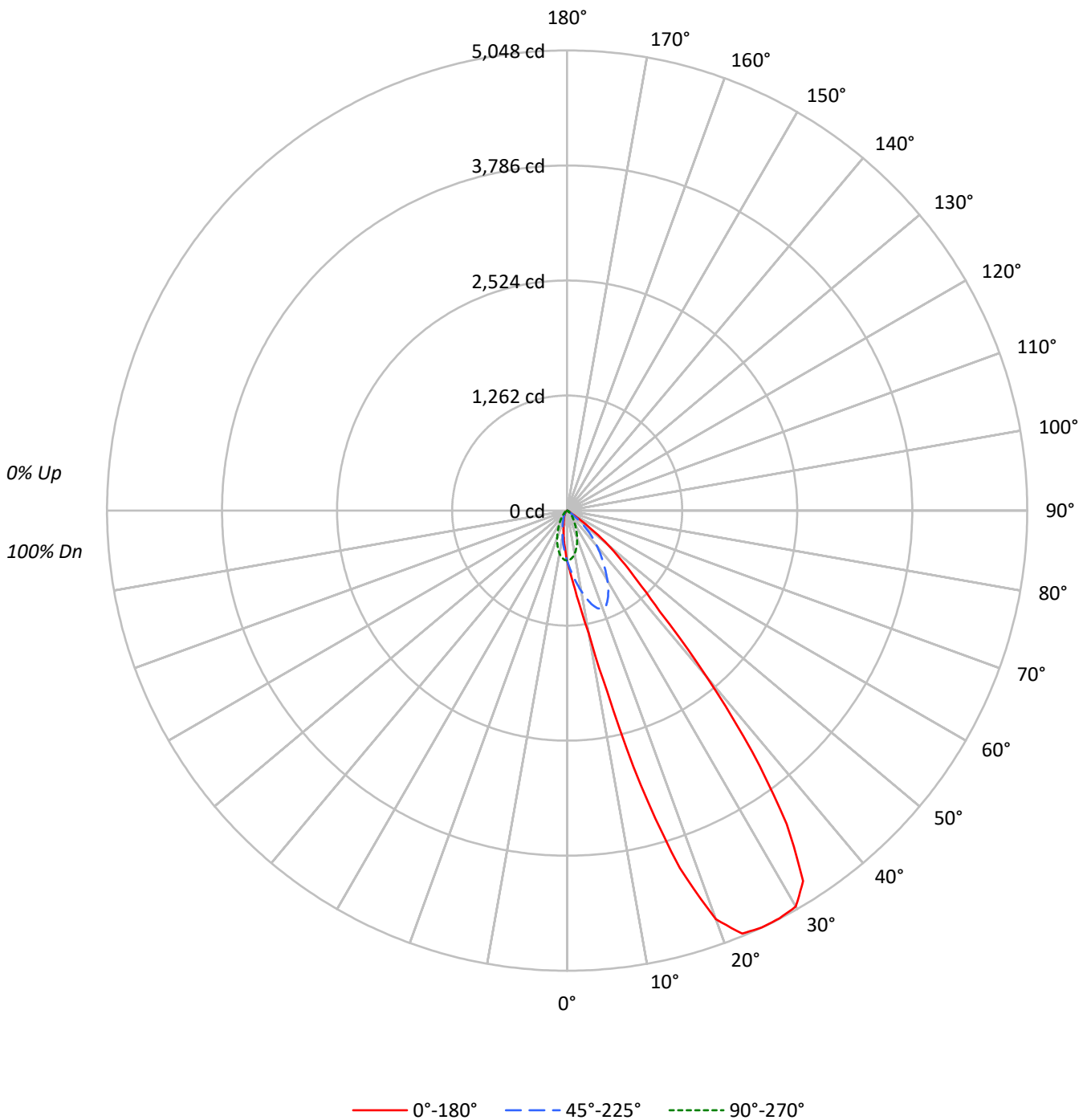
Input Watts (W): 19.1
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	110	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92					92			
2	106	100	96	92	104	99	94	91	95	92	89	92	89	87	90	87	85	83					83			
3	100	92	86	82	97	91	85	81	88	84	80	85	82	79	83	80	77	76					76			
4	93	85	78	73	91	83	77	73	81	76	72	79	75	71	77	73	70	69					69			
5	88	78	71	66	86	77	70	66	75	69	65	73	68	65	72	67	64	62					62			
6	82	72	65	60	80	71	64	60	69	63	59	68	63	59	66	62	58	57					57			
7	77	66	59	54	76	66	59	54	64	58	54	63	58	54	62	57	53	52					52			
8	72	61	54	50	71	61	54	50	60	54	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	52	46	42	51	45	41	50	45	41	40					40			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	32681	32681	32681
5°	47367	31018	21040
10°	79304	27652	13016
15°	179741	23329	8573
20°	276237	18604	5989
25°	295797	13853	4512
30°	299779	10224	3579
35°	257941	7502	2722
40°	151246	5499	2083
45°	72102	3628	1247
50°	41470	2356	607
55°	11497	1524	121
60°	3049	1014	0
65°	1961	486	0
70°	1019	161	0
75°	359	185	0
80°	0	219	0
85°	0	271	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	54.8	3.8
10°-20°	235.9	16.4
20°-30°	473.5	32.9
30°-40°	427.0	29.7
40°-50°	191.0	13.3
50°-60°	45.0	3.1
60°-70°	8.7	0.6
70°-80°	1.9	0.1
80°-90°	1.0	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°	764.2	53.1
0°-40°	1191.2	82.8
0°-60°	1427.3	99.2
0°-90°	1438.9	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1438.9	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	548	548	548	548	548	
5°	809	711	530	411	359	94
15°	3116	1072	404	194	149	927
25°	5048	1058	236	98	77	2317
35°	4198	686	122	58	44	2487
45°	1081	343	54	26	19	927
55°	152	44	20	7	2	187
65°	22	16	5	2	0	22
75°	3	2	2	1	0	4
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°	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5
2.5°	655.7	657.2	653.3	643.2	649.4	640.9	633.1	633.9	622.2	627.7	612.1
5°	808.9	805.0	804.2	784.8	784.0	766.9	759.9	739.7	717.9	710.9	684.4
7.5°	1034.4	1019.7	1003.3	982.3	968.3	933.3	906.9	867.2	826.8	803.4	756.0
10°	1369.7	1351.0	1323.0	1272.4	1232.0	1162.0	1091.2	1019.7	951.2	899.9	825.2
12.5°	2030.8	1970.1	1853.4	1730.5	1632.5	1467.7	1313.7	1196.2	1081.1	991.7	885.9
15°	3115.7	3024.7	2861.4	2591.5	2300.6	1918.8	1624.8	1386.0	1208.7	1071.8	929.4
17.5°	4112.1	4030.4	3827.4	3456.4	3104.1	2525.4	1976.3	1591.3	1311.3	1127.0	951.2
20°	4769.3	4749.8	4544.5	4137.0	3691.3	3073.7	2349.6	1746.1	1373.5	1144.9	945.8
22.5°	5022.8	5029.8	4888.3	4535.2	4059.2	3356.9	2551.9	1806.8	1375.9	1121.5	912.3
25°	5047.7	5081.9	4997.2	4673.6	4180.5	3428.4	2532.4	1741.4	1298.9	1058.5	854.0
27.5°	5042.3	5075.7	4985.5	4626.2	4067.7	3268.2	2297.5	1592.9	1213.3	977.7	769.2
30°	5016.6	5034.5	4867.3	4411.5	3741.1	2891.0	1962.3	1408.5	1093.5	882.8	716.3
32.5°	4817.5	4819.8	4504.8	3942.5	3214.5	2324.0	1610.0	1207.9	957.4	782.4	643.2
35°	4198.4	4146.3	3778.4	3257.3	2491.2	1781.1	1306.7	1028.2	829.9	686.0	564.7
37.5°	3337.4	3281.4	2947.0	2394.8	1768.6	1379.0	1085.0	871.1	718.7	599.7	487.7
40°	2373.8	2268.8	2018.3	1636.4	1330.0	1085.8	892.9	728.8	614.4	510.2	414.6
42.5°	1504.2	1507.3	1376.7	1184.5	1034.4	866.4	721.8	605.1	508.7	420.8	340.7
45°	1081.1	1073.3	1004.1	896.0	804.2	690.7	591.1	497.8	415.3	343.0	275.3
47.5°	810.4	804.2	767.7	696.9	630.0	560.0	477.6	398.2	331.3	263.7	207.7
50°	588.0	597.3	567.8	514.9	462.0	405.2	342.2	271.4	220.9	170.3	128.3
52.5°	336.0	349.2	328.2	291.7	261.3	221.7	182.8	142.3	112.0	84.0	67.7
55°	152.4	143.9	138.4	124.4	108.1	90.2	75.4	61.4	51.3	43.6	39.7
57.5°	56.0	55.2	55.2	50.6	46.7	43.6	39.7	36.6	35.0	32.7	31.9
60°	37.3	37.3	36.6	35.0	34.2	33.4	31.9	30.3	28.8	26.4	24.9
62.5°	28.0	28.8	28.0	27.2	27.2	26.4	24.9	24.1	22.6	21.0	20.2
65°	21.8	21.8	21.8	21.0	21.0	20.2	19.4	18.7	17.1	15.6	14.8
67.5°	15.6	15.6	15.6	15.6	14.8	14.8	14.0	12.4	12.4	10.9	10.1
70°	10.1	10.1	10.1	10.1	9.3	9.3	8.6	8.6	7.8	7.0	6.2
72.5°	6.2	6.2	6.2	5.4	5.4	5.4	4.7	4.7	4.7	3.9	3.1
75°	3.1	3.1	2.3	2.3	2.3	2.3	2.3	1.6	1.6	1.6	1.6
77.5°	0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	1.6	1.6	1.6
80°	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	1.6	1.6	1.6
82.5°	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	1.6	1.6
85°	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	1.6	1.6
87.5°	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.8	0.8	1.6	1.6
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°	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5
2.5°	606.7	593.4	584.9	577.1	568.5	558.4	549.9	543.7	532.8	532.0	517.2
5°	667.3	644.0	622.2	602.8	584.9	564.7	546.0	529.7	511.0	500.9	479.9
7.5°	725.7	686.0	651.8	620.7	591.1	560.0	532.0	507.9	479.9	464.3	434.8
10°	772.3	719.4	670.4	627.7	587.2	546.8	510.2	477.6	444.9	421.6	389.7
12.5°	794.1	737.3	674.3	621.4	570.9	522.7	479.1	442.6	406.8	381.9	346.1
15°	829.1	738.9	665.8	602.8	544.4	491.6	441.8	404.4	366.3	336.0	299.4
17.5°	827.5	727.2	644.8	574.0	510.2	453.4	403.7	362.4	322.0	291.7	256.7
20°	807.3	700.8	612.1	538.2	471.3	410.7	361.7	321.2	278.4	249.7	223.2
22.5°	768.4	661.9	572.4	495.4	427.0	367.1	316.6	276.9	238.0	211.6	182.8
25°	717.9	614.4	522.7	448.8	383.4	322.8	273.8	236.4	203.0	178.9	161.0
27.5°	662.7	560.0	470.6	399.0	337.6	277.7	234.9	201.4	172.7	151.7	132.2
30°	600.4	501.7	417.7	351.6	288.6	236.4	199.9	171.1	146.2	129.9	114.3
32.5°	535.1	440.2	364.0	301.8	245.8	200.7	168.8	144.7	124.4	111.2	98.0
35°	463.6	381.1	311.1	254.3	206.9	168.8	141.6	122.1	105.8	95.7	84.0
37.5°	397.4	323.6	261.3	211.6	171.9	140.0	119.0	102.7	89.4	81.7	72.3
40°	332.1	265.2	214.7	173.4	140.8	115.9	98.8	86.3	75.4	69.2	63.8
42.5°	270.7	218.6	174.2	140.0	114.3	95.7	80.9	70.0	61.4	56.8	50.6
45°	215.4	172.7	136.9	111.2	88.7	73.1	62.2	54.4	48.2	45.1	39.7
47.5°	157.9	122.9	98.8	77.0	63.8	52.9	45.9	41.2	37.3	35.8	33.4
50°	96.4	74.7	61.4	49.8	43.6	38.9	35.8	33.4	30.3	28.0	24.9
52.5°	52.9	44.3	40.4	36.6	34.2	31.1	28.8	26.4	23.3	21.8	19.4
55°	35.8	34.2	32.7	29.6	27.2	24.1	21.8	20.2	18.7	17.1	15.6
57.5°	29.6	28.0	25.7	23.3	21.0	18.7	17.1	16.3	14.0	13.2	11.7
60°	23.3	21.8	20.2	18.7	17.1	14.8	14.0	12.4	10.9	9.3	8.6
62.5°	17.9	16.3	15.6	14.0	12.4	10.9	10.1	8.6	7.8	6.2	5.4
65°	13.2	12.4	10.9	10.1	8.6	7.8	7.0	5.4	4.7	3.9	3.1
67.5°	9.3	8.6	7.8	6.2	5.4	4.7	3.9	3.1	2.3	2.3	1.6
70°	5.4	4.7	4.7	3.9	3.1	2.3	2.3	1.6	1.6	1.6	1.6
72.5°	3.1	2.3	2.3	2.3	1.6	1.6	1.6	1.6	1.6	1.6	1.6
75°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
77.5°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
80°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
82.5°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
85°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
87.5°	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
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°	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5	547.5
2.5°	506.3	502.4	508.7	486.1	482.2	483.0	479.1	469.8	462.8	462.0	455.8
5°	460.4	450.3	441.8	423.1	415.3	410.7	402.9	390.4	382.7	380.3	371.8
7.5°	412.2	398.2	386.6	362.4	353.9	347.7	335.2	323.6	311.9	308.8	296.3
10°	367.1	346.9	334.4	305.7	294.8	287.8	271.4	262.1	252.0	245.8	239.6
12.5°	318.1	298.7	280.8	258.2	245.0	236.4	222.4	211.6	205.3	199.9	192.1
15°	271.4	252.8	236.4	214.7	203.0	194.4	182.8	173.4	167.2	162.6	157.1
17.5°	230.2	212.3	196.8	178.9	168.0	161.0	152.4	139.2	137.7	135.3	132.2
20°	194.4	178.1	164.9	149.3	140.8	135.3	127.6	121.3	115.9	113.6	108.9
22.5°	163.3	149.3	138.4	126.0	119.8	114.3	108.1	104.2	98.0	96.4	93.3
25°	138.4	127.6	119.0	108.1	103.4	98.0	92.6	88.7	84.8	83.2	80.9
27.5°	116.7	109.7	102.7	93.3	88.7	85.6	80.1	77.0	73.9	72.3	70.8
30°	101.9	94.1	88.7	80.9	77.8	74.7	70.8	67.7	65.3	63.0	62.2
32.5°	88.7	82.4	78.6	71.6	69.2	66.1	63.0	59.9	57.6	56.0	53.7
35°	77.0	71.6	68.4	63.0	61.4	57.6	54.4	52.1	49.8	48.2	46.7
37.5°	66.1	62.2	59.9	54.4	52.9	49.8	46.7	45.1	42.8	41.2	39.7
40°	56.0	52.9	49.8	45.9	43.6	41.2	38.9	37.3	35.8	35.0	33.4
42.5°	45.9	42.8	40.4	37.3	35.8	34.2	31.9	30.3	29.6	28.0	26.4
45°	36.6	35.0	32.7	29.6	28.8	26.4	24.1	23.3	21.8	20.2	19.4
47.5°	29.6	27.2	25.7	22.6	21.0	19.4	18.7	17.1	16.3	15.6	14.8
50°	22.6	21.0	19.4	17.9	16.3	15.6	14.0	12.4	11.7	10.9	10.1
52.5°	17.9	16.3	15.6	13.2	12.4	10.9	10.1	8.6	7.8	7.0	6.2
55°	14.0	12.4	11.7	9.3	8.6	7.0	6.2	5.4	4.7	3.9	3.1
57.5°	10.1	8.6	7.8	6.2	5.4	4.7	3.1	2.3	1.6	1.6	0.8
60°	7.0	6.2	4.7	3.9	3.1	2.3	1.6	0.8	0.8	0.8	0.8
62.5°	4.7	3.9	3.1	2.3	1.6	1.6	1.6	0.8	0.8	0.8	0.8
65°	2.3	1.6	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8
67.5°	1.6	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8
70°	1.6	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8
72.5°	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.8
75°	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.0
77.5°	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.0
80°	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.0
82.5°	1.6	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.0
85°	1.6	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.8	0.0
87.5°	1.6	1.6	1.6	0.8	0.8	0.8	0.8	0.8	0.8	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):

	165°	170°	175°	180°
0°	547.5	547.5	547.5	547.5
2.5°	465.1	458.9	448.0	444.9
5°	376.4	371.8	364.8	359.3
7.5°	298.7	293.2	290.1	284.7
10°	238.0	233.3	230.2	224.8
12.5°	192.9	188.2	183.6	182.0
15°	157.1	154.8	149.3	148.6
17.5°	129.1	126.8	125.2	122.9
20°	110.4	107.3	105.0	103.4
22.5°	94.1	91.8	89.4	89.4
25°	80.1	79.3	77.8	77.0
27.5°	70.8	70.0	68.4	67.7
30°	63.0	61.4	60.7	59.9
32.5°	54.4	52.9	52.1	52.1
35°	46.7	45.1	44.3	44.3
37.5°	40.4	38.9	38.1	38.1
40°	33.4	32.7	32.7	32.7
42.5°	27.2	25.7	25.7	25.7
45°	19.4	18.7	18.7	18.7
47.5°	14.8	14.0	13.2	13.2
50°	10.1	9.3	9.3	8.6
52.5°	6.2	5.4	4.7	4.7
55°	2.3	2.3	1.6	1.6
57.5°	0.8	0.0	0.0	0.0
60°	0.8	0.0	0.0	0.0
62.5°	0.8	0.8	0.0	0.0
65°	0.8	0.0	0.0	0.0
67.5°	0.8	0.0	0.0	0.0
70°	0.0	0.0	0.0	0.0
72.5°	0.0	0.0	0.0	0.0
75°	0.0	0.0	0.0	0.0
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)