

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 - HLM6935 - 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 - HLM6935 - 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 / 3500K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1501.6 lumens  
Efficiency: N/A  
Efficacy: 78.6 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

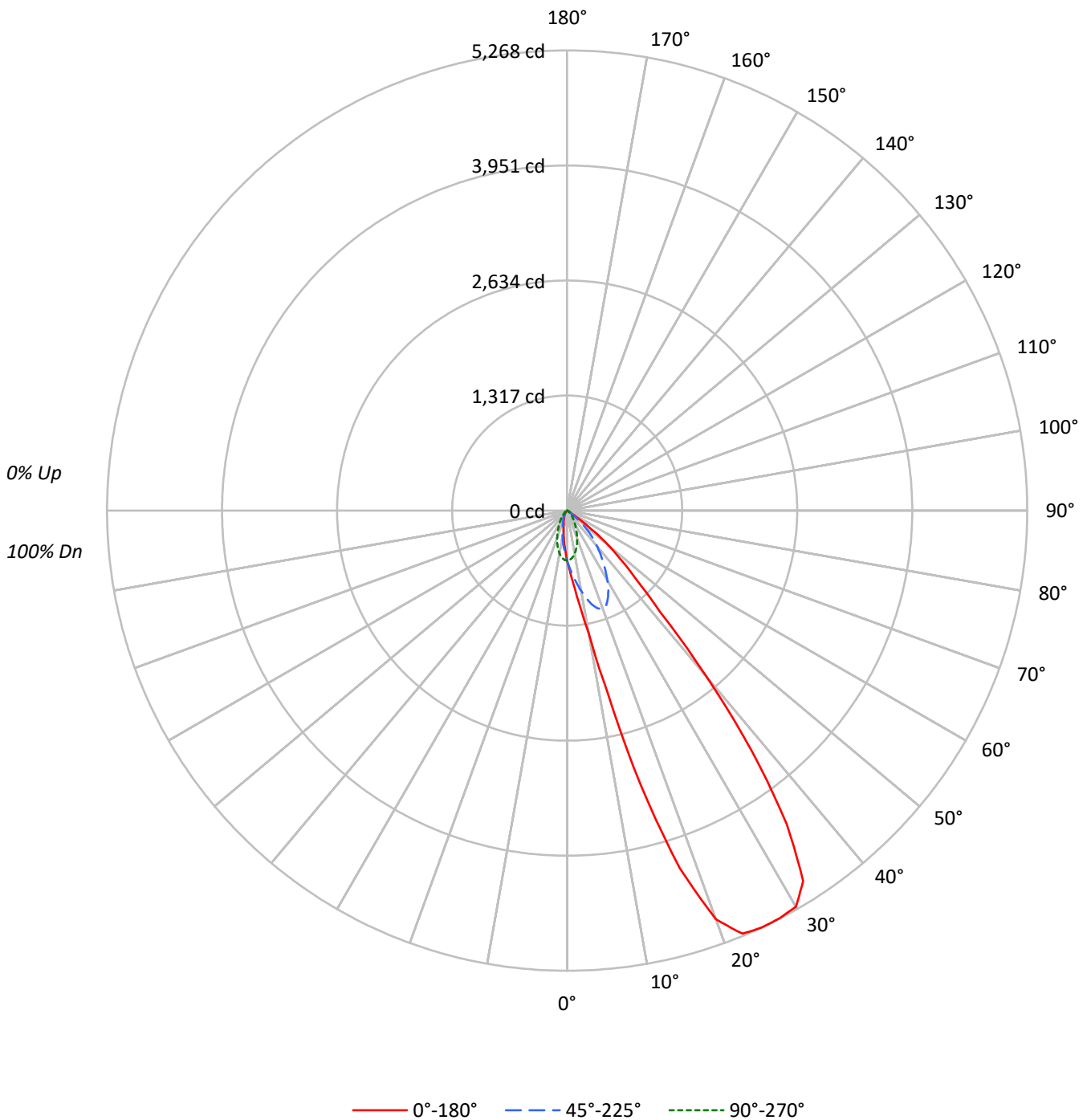
Input Watts (W): 19.1  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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	71	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°	34113	34113	34113
5°	49434	32371	21959
10°	82766	28857	13583
15°	187599	24350	8942
20°	288302	19421	6255
25°	308719	14463	4711
30°	312877	10673	3735
35°	269208	7827	2845
40°	157846	5741	2173
45°	75250	3788	1301
50°	43283	2461	628
55°	12002	1592	121
60°	3188	1063	0
65°	2042	513	0
70°	1069	161	0
75°	371	185	0
80°	0	219	0
85°	0	271	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	57.2	3.8
10°-20°	246.2	16.4
20°-30°	494.2	32.9
30°-40°	445.6	29.7
40°-50°	199.4	13.3
50°-60°	47.0	3.1
60°-70°	9.1	0.6
70°-80°	2.0	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°	797.6	53.1
0°-40°	1243.2	82.8
0°-60°	1489.6	99.2
0°-90°	1501.6	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1501.6	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	572	572	572	572	572	
5°	844	742	553	429	375	98
15°	3252	1119	422	203	155	968
25°	5268	1105	247	102	80	2418
35°	4382	716	127	60	46	2595
45°	1128	358	57	28	20	967
55°	159	46	21	7	2	196
65°	23	16	6	2	0	23
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°	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5
2.5°	684.3	685.9	681.9	671.3	677.8	668.9	660.8	661.6	649.4	655.1	638.8
5°	844.2	840.2	839.3	819.1	818.2	800.4	793.1	772.0	749.2	741.9	714.3
7.5°	1079.6	1064.2	1047.2	1025.2	1010.6	974.1	946.5	905.1	862.9	838.5	789.0
10°	1429.5	1410.0	1380.8	1328.0	1285.8	1212.7	1138.9	1064.2	992.8	939.2	861.3
12.5°	2119.5	2056.2	1934.4	1806.1	1703.9	1531.8	1371.0	1248.5	1128.3	1035.0	924.6
15°	3251.9	3156.9	2986.4	2704.7	2401.1	2002.6	1695.7	1446.5	1261.5	1118.6	970.0
17.5°	4291.7	4206.5	3994.6	3607.4	3239.7	2635.7	2062.6	1660.8	1368.6	1176.2	992.8
20°	4977.6	4957.3	4743.0	4317.7	3852.5	3208.0	2452.3	1822.4	1433.5	1194.9	987.1
22.5°	5242.3	5249.6	5101.8	4733.3	4236.5	3503.5	2663.3	1885.7	1436.0	1170.5	952.2
25°	5268.2	5303.9	5215.5	4877.8	4363.1	3578.2	2643.0	1817.5	1355.6	1104.8	891.3
27.5°	5262.5	5297.5	5203.3	4828.3	4245.4	3411.0	2397.9	1662.5	1266.3	1020.4	802.8
30°	5235.8	5254.4	5079.9	4604.2	3904.5	3017.3	2048.0	1470.1	1141.3	921.3	747.6
32.5°	5028.0	5030.4	4701.6	4114.7	3354.9	2425.5	1680.3	1260.6	999.3	816.6	671.3
35°	4381.8	4327.4	3943.5	3399.6	2600.0	1858.9	1363.7	1073.1	866.1	716.0	589.3
37.5°	3483.2	3424.8	3075.7	2499.4	1845.9	1439.2	1132.4	909.2	750.1	625.9	509.0
40°	2477.4	2367.9	2106.5	1707.9	1388.1	1133.2	931.9	760.6	641.3	532.5	432.7
42.5°	1569.9	1573.2	1436.8	1236.3	1079.6	904.3	753.3	631.5	530.9	439.2	355.5
45°	1128.3	1120.2	1048.0	935.1	839.3	720.8	616.9	519.5	433.5	358.0	287.4
47.5°	845.8	839.3	801.2	727.3	657.5	584.5	498.4	415.6	345.8	275.2	216.7
50°	613.7	623.4	592.6	537.4	482.2	422.9	357.2	283.3	230.5	177.8	133.9
52.5°	350.7	364.5	342.6	304.4	272.7	231.3	190.8	148.5	116.9	87.7	70.6
55°	159.1	150.2	144.5	129.9	112.8	94.2	78.7	64.1	53.6	45.5	41.4
57.5°	58.4	57.6	57.6	52.8	48.7	45.5	41.4	38.2	36.5	34.1	33.3
60°	39.0	39.0	38.2	36.5	35.7	34.9	33.3	31.7	30.0	27.6	26.0
62.5°	29.2	30.0	29.2	28.4	28.4	27.6	26.0	25.2	23.5	21.9	21.1
65°	22.7	22.7	22.7	21.9	21.9	21.1	20.3	19.5	17.9	16.2	15.4
67.5°	16.2	16.2	16.2	16.2	15.4	15.4	14.6	13.0	13.0	11.4	10.6
70°	10.6	10.6	10.6	10.6	9.7	9.7	8.9	8.9	8.1	7.3	6.5
72.5°	6.5	6.5	6.5	5.7	5.7	5.7	4.9	4.9	4.9	4.1	3.2
75°	3.2	3.2	2.4	2.4	2.4	2.4	2.4	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°	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5
2.5°	633.2	619.4	610.4	602.3	593.4	582.8	573.9	567.4	556.0	555.2	539.8
5°	696.5	672.1	649.4	629.1	610.4	589.3	569.8	552.8	533.3	522.8	500.8
7.5°	757.4	716.0	680.2	647.8	616.9	584.5	555.2	530.1	500.8	484.6	453.8
10°	806.1	750.9	699.7	655.1	612.9	570.7	532.5	498.4	464.3	440.0	406.7
12.5°	828.8	769.5	703.8	648.6	595.8	545.5	500.0	461.9	424.5	398.6	361.2
15°	865.3	771.2	694.9	629.1	568.2	513.0	461.1	422.1	382.3	350.7	312.5
17.5°	863.7	759.0	672.9	599.1	532.5	473.2	421.3	378.3	336.1	304.4	267.9
20°	842.6	731.4	638.8	561.7	491.9	428.6	377.5	335.3	290.6	260.6	233.0
22.5°	802.0	690.8	597.4	517.1	445.6	383.1	330.4	289.0	248.4	220.8	190.8
25°	749.2	641.3	545.5	468.4	400.2	336.9	285.7	246.8	211.9	186.7	168.0
27.5°	691.6	584.5	491.1	416.4	352.3	289.8	245.1	210.2	180.2	158.3	138.0
30°	626.7	523.6	435.9	366.9	301.2	246.8	208.6	178.6	152.6	135.6	119.3
32.5°	558.5	459.4	379.9	315.0	256.5	209.4	176.1	151.0	129.9	116.1	102.3
35°	483.8	397.8	324.7	265.4	215.9	176.1	147.7	127.4	110.4	99.8	87.7
37.5°	414.8	337.7	272.7	220.8	179.4	146.1	124.2	107.2	93.4	85.2	75.5
40°	346.6	276.8	224.0	181.0	146.9	121.0	103.1	90.1	78.7	72.2	66.6
42.5°	282.5	228.1	181.8	146.1	119.3	99.8	84.4	73.1	64.1	59.3	52.8
45°	224.9	180.2	142.9	116.1	92.5	76.3	64.9	56.8	50.3	47.1	41.4
47.5°	164.8	128.3	103.1	80.4	66.6	55.2	47.9	43.0	39.0	37.3	34.9
50°	100.7	77.9	64.1	52.0	45.5	40.6	37.3	34.9	31.7	29.2	26.0
52.5°	55.2	46.3	42.2	38.2	35.7	32.5	30.0	27.6	24.4	22.7	20.3
55°	37.3	35.7	34.1	30.8	28.4	25.2	22.7	21.1	19.5	17.9	16.2
57.5°	30.8	29.2	26.8	24.4	21.9	19.5	17.9	17.0	14.6	13.8	12.2
60°	24.4	22.7	21.1	19.5	17.9	15.4	14.6	13.0	11.4	9.7	8.9
62.5°	18.7	17.0	16.2	14.6	13.0	11.4	10.6	8.9	8.1	6.5	5.7
65°	13.8	13.0	11.4	10.6	8.9	8.1	7.3	5.7	4.9	4.1	3.2
67.5°	9.7	8.9	8.1	6.5	5.7	4.9	4.1	3.2	2.4	2.4	1.6
70°	5.7	4.9	4.9	4.1	3.2	2.4	2.4	1.6	1.6	1.6	1.6
72.5°	3.2	2.4	2.4	2.4	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°	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5	571.5
2.5°	528.4	524.4	530.9	507.3	503.3	504.1	500.0	490.3	483.0	482.2	475.7
5°	480.6	470.0	461.1	441.6	433.5	428.6	420.5	407.5	399.4	396.9	388.0
7.5°	430.2	415.6	403.4	378.3	369.3	362.9	349.9	337.7	325.5	322.3	309.3
10°	383.1	362.0	349.1	319.0	307.7	300.3	283.3	273.6	263.0	256.5	250.0
12.5°	332.0	311.7	293.0	269.5	255.7	246.8	232.2	220.8	214.3	208.6	200.5
15°	283.3	263.8	246.8	224.0	211.9	202.9	190.8	181.0	174.5	169.7	164.0
17.5°	240.3	221.6	205.4	186.7	175.3	168.0	159.1	145.3	143.7	141.2	138.0
20°	202.9	185.9	172.1	155.9	146.9	141.2	133.1	126.6	121.0	118.5	113.6
22.5°	170.5	155.9	144.5	131.5	125.0	119.3	112.8	108.8	102.3	100.7	97.4
25°	144.5	133.1	124.2	112.8	108.0	102.3	96.6	92.5	88.5	86.9	84.4
27.5°	121.8	114.5	107.2	97.4	92.5	89.3	83.6	80.4	77.1	75.5	73.9
30°	106.3	98.2	92.5	84.4	81.2	77.9	73.9	70.6	68.2	65.8	64.9
32.5°	92.5	86.0	82.0	74.7	72.2	69.0	65.8	62.5	60.1	58.4	56.0
35°	80.4	74.7	71.4	65.8	64.1	60.1	56.8	54.4	52.0	50.3	48.7
37.5°	69.0	64.9	62.5	56.8	55.2	52.0	48.7	47.1	44.6	43.0	41.4
40°	58.4	55.2	52.0	47.9	45.5	43.0	40.6	39.0	37.3	36.5	34.9
42.5°	47.9	44.6	42.2	39.0	37.3	35.7	33.3	31.7	30.8	29.2	27.6
45°	38.2	36.5	34.1	30.8	30.0	27.6	25.2	24.4	22.7	21.1	20.3
47.5°	30.8	28.4	26.8	23.5	21.9	20.3	19.5	17.9	17.0	16.2	15.4
50°	23.5	21.9	20.3	18.7	17.0	16.2	14.6	13.0	12.2	11.4	10.6
52.5°	18.7	17.0	16.2	13.8	13.0	11.4	10.6	8.9	8.1	7.3	6.5
55°	14.6	13.0	12.2	9.7	8.9	7.3	6.5	5.7	4.9	4.1	3.2
57.5°	10.6	8.9	8.1	6.5	5.7	4.9	3.2	2.4	1.6	1.6	0.8
60°	7.3	6.5	4.9	4.1	3.2	2.4	1.6	0.8	0.8	0.8	0.8
62.5°	4.9	4.1	3.2	2.4	1.6	1.6	1.6	0.8	0.8	0.8	0.8
65°	2.4	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°	571.5	571.5	571.5	571.5
2.5°	485.4	478.9	467.6	464.3
5°	392.9	388.0	380.7	375.0
7.5°	311.7	306.0	302.8	297.1
10°	248.4	243.5	240.3	234.6
12.5°	201.3	196.4	191.6	189.9
15°	164.0	161.5	155.9	155.0
17.5°	134.7	132.3	130.7	128.3
20°	115.3	112.0	109.6	108.0
22.5°	98.2	95.8	93.4	93.4
25°	83.6	82.8	81.2	80.4
27.5°	73.9	73.1	71.4	70.6
30°	65.8	64.1	63.3	62.5
32.5°	56.8	55.2	54.4	54.4
35°	48.7	47.1	46.3	46.3
37.5°	42.2	40.6	39.8	39.8
40°	34.9	34.1	34.1	34.1
42.5°	28.4	26.8	26.8	26.8
45°	20.3	19.5	19.5	19.5
47.5°	15.4	14.6	13.8	13.8
50°	10.6	9.7	9.7	8.9
52.5°	6.5	5.7	4.9	4.9
55°	2.4	2.4	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)