

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 - HLM6940 - 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 - HLM6940 - 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 / 4000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 1591.1 lumens
Efficiency: N/A
Efficacy: 83.3 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

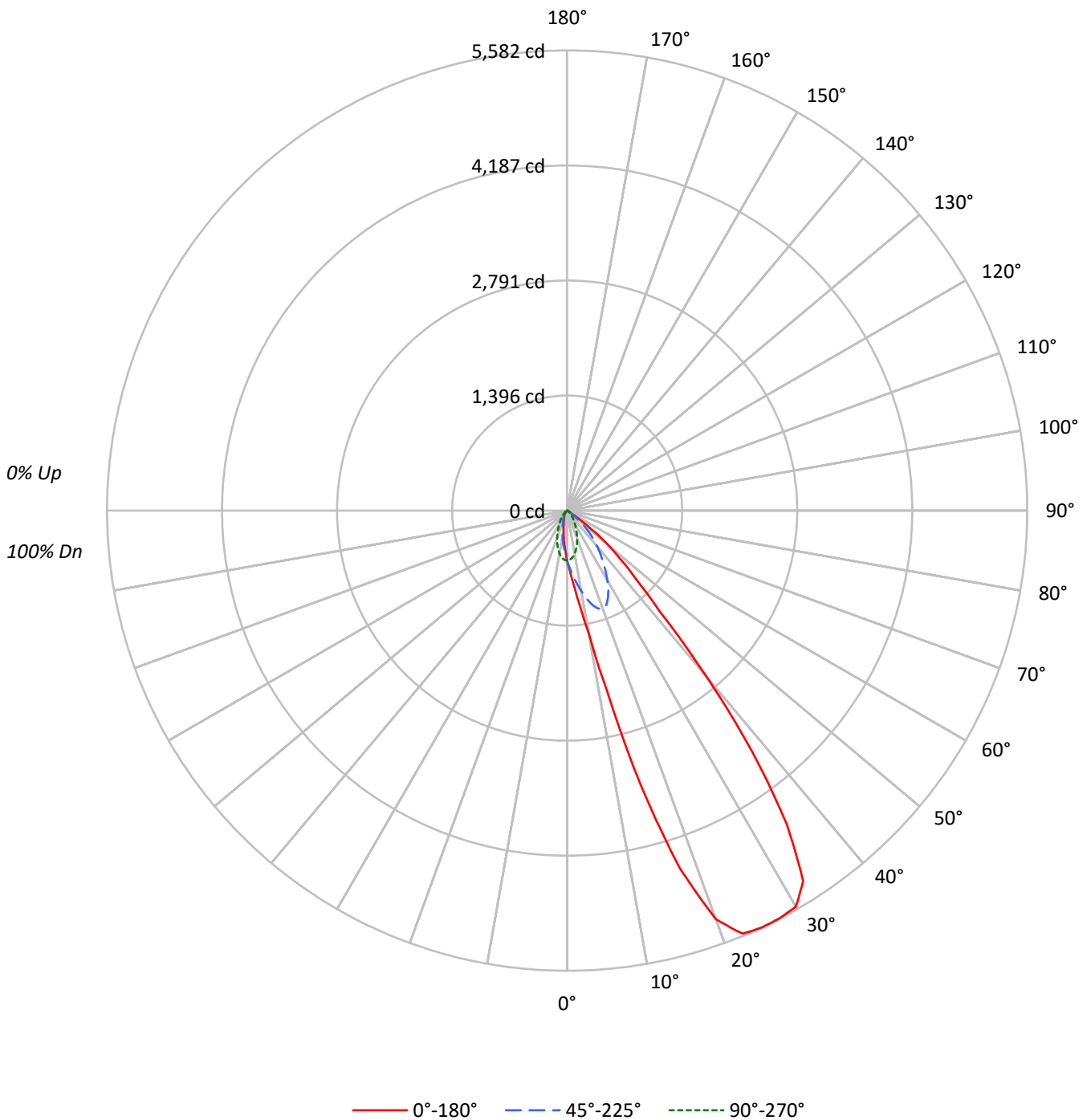
Input Watts (W): 19.1
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	100	100	100	100	100		
1	113	110	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92	92	92	92	92	92	92		
2	106	100	96	92	104	99	94	91	95	92	89	92	89	87	90	87	85	83	83	83	83	83	83	83		
3	100	92	86	82	97	91	85	81	88	84	80	85	82	79	83	80	77	76	76	76	76	76	76	76		
4	93	85	78	73	91	83	77	73	81	76	72	79	75	71	77	73	70	69	69	69	69	69	69	69		
5	88	78	71	66	86	77	71	66	75	69	65	73	68	65	72	67	64	62	62	62	62	62	62	62		
6	82	72	65	60	80	71	64	60	69	63	59	68	63	59	66	62	58	57	57	57	57	57	57	57		
7	77	66	59	54	76	66	59	54	64	58	54	63	58	54	62	57	53	52	52	52	52	52	52	52		
8	72	61	54	50	71	61	54	50	60	54	49	58	53	49	57	52	49	47	47	47	47	47	47	47		
9	68	57	50	45	67	56	50	45	55	49	45	54	49	45	53	48	45	43	43	43	43	43	43	43		
10	64	53	46	42	63	52	46	42	52	46	42	51	45	41	50	45	41	40	40	40	40	40	40	40		

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	36143	36143	36143
5°	52380	34297	23271
10°	87699	30576	14394
15°	198779	25804	9478
20°	305487	20573	6626
25°	327119	15324	4993
30°	331522	11306	3956
35°	285256	8294	3010
40°	167257	6085	2300
45°	79739	4015	1374
50°	45864	2610	670
55°	12719	1690	128
60°	3376	1128	0
65°	2168	540	0
70°	1130	171	0
75°	394	197	0
80°	0	233	0
85°	0	288	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	60.6	3.8
10°-20°	260.9	16.4
20°-30°	523.6	32.9
30°-40°	472.2	29.7
40°-50°	211.3	13.3
50°-60°	49.8	3.1
60°-70°	9.6	0.6
70°-80°	2.1	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°	845.2	53.1
0°-40°	1317.3	82.8
0°-60°	1578.4	99.2
0°-90°	1591.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1591.1	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	606	606	606	606	606	
5°	894	786	586	454	397	104
15°	3446	1185	447	215	164	1025
25°	5582	1171	262	108	85	2563
35°	4643	759	135	64	49	2750
45°	1196	379	60	29	21	1025
55°	169	48	22	8	2	207
65°	24	17	6	2	0	24
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°	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5
2.5°	725.1	726.8	722.5	711.3	718.2	708.7	700.1	701.0	688.1	694.1	676.9
5°	894.5	890.2	889.4	867.9	867.0	848.1	840.3	818.0	793.9	786.2	756.9
7.5°	1144.0	1127.6	1109.6	1086.3	1070.9	1032.2	1002.9	959.0	914.3	888.5	836.0
10°	1514.7	1494.0	1463.1	1407.2	1362.4	1285.0	1206.8	1127.6	1051.9	995.2	912.6
12.5°	2245.8	2178.7	2049.7	1913.8	1805.4	1623.1	1452.8	1322.9	1195.6	1096.7	979.7
15°	3445.7	3345.0	3164.4	2865.9	2544.3	2121.9	1796.8	1532.7	1336.6	1185.3	1027.9
17.5°	4547.5	4457.2	4232.7	3822.4	3432.8	2792.8	2185.6	1759.8	1450.2	1246.3	1051.9
20°	5274.3	5252.8	5025.7	4575.0	4082.2	3399.2	2598.4	1931.0	1519.0	1266.1	1045.9
22.5°	5554.7	5562.4	5405.9	5015.4	4489.0	3712.3	2822.1	1998.1	1521.6	1240.3	1008.9
25°	5582.2	5620.1	5526.3	5168.5	4623.2	3791.4	2800.6	1925.8	1436.4	1170.6	944.4
27.5°	5576.2	5613.2	5513.4	5116.0	4498.5	3614.2	2540.8	1761.5	1341.8	1081.2	850.7
30°	5547.8	5567.6	5382.7	4878.6	4137.2	3197.1	2170.1	1557.7	1209.3	976.2	792.2
32.5°	5327.6	5330.2	4981.8	4360.0	3554.9	2570.1	1780.5	1335.8	1058.8	865.3	711.3
35°	4643.0	4585.3	4178.5	3602.2	2755.0	1969.7	1445.0	1137.1	917.8	758.6	624.5
37.5°	3690.8	3628.9	3259.0	2648.3	1955.9	1525.0	1199.9	963.3	794.8	663.2	539.3
40°	2625.1	2509.0	2232.0	1809.7	1470.8	1200.7	987.4	805.9	679.5	564.2	458.4
42.5°	1663.5	1666.9	1522.4	1310.0	1144.0	958.2	798.2	669.2	562.5	465.3	376.7
45°	1195.6	1187.0	1110.4	990.9	889.4	763.8	653.7	550.5	459.3	379.3	304.5
47.5°	896.3	889.4	848.9	770.7	696.7	619.3	528.1	440.4	366.4	291.6	229.7
50°	650.3	660.6	627.9	569.4	510.9	448.1	378.5	300.2	244.3	188.4	141.9
52.5°	371.6	386.2	363.0	322.5	289.0	245.1	202.1	157.4	123.9	92.9	74.8
55°	168.6	159.1	153.1	137.6	119.6	99.8	83.4	67.9	56.8	48.2	43.9
57.5°	61.9	61.1	61.1	55.9	51.6	48.2	43.9	40.4	38.7	36.1	35.3
60°	41.3	41.3	40.4	38.7	37.8	37.0	35.3	33.5	31.8	29.2	27.5
62.5°	31.0	31.8	31.0	30.1	30.1	29.2	27.5	26.7	24.9	23.2	22.4
65°	24.1	24.1	24.1	23.2	23.2	22.4	21.5	20.6	18.9	17.2	16.3
67.5°	17.2	17.2	17.2	17.2	16.3	16.3	15.5	13.8	13.8	12.0	11.2
70°	11.2	11.2	11.2	11.2	10.3	10.3	9.5	9.5	8.6	7.7	6.9
72.5°	6.9	6.9	6.9	6.0	6.0	6.0	5.2	5.2	5.2	4.3	3.4
75°	3.4	3.4	2.6	2.6	2.6	2.6	2.6	1.7	1.7	1.7	1.7
77.5°	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	1.7	1.7	1.7
80°	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	1.7	1.7	1.7
82.5°	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	1.7	1.7
85°	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	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°	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5
2.5°	670.9	656.3	646.8	638.2	628.8	617.6	608.1	601.2	589.2	588.3	572.0
5°	738.0	712.2	688.1	666.6	646.8	624.5	603.8	585.7	565.1	553.9	530.7
7.5°	802.5	758.6	720.8	686.4	653.7	619.3	588.3	561.7	530.7	513.5	480.8
10°	854.1	795.6	741.4	694.1	649.4	604.7	564.2	528.1	492.0	466.2	430.9
12.5°	878.2	815.4	745.7	687.2	631.3	578.0	529.8	489.4	449.8	422.3	382.8
15°	916.9	817.1	736.3	666.6	602.1	543.6	488.6	447.3	405.1	371.6	331.1
17.5°	915.2	804.2	713.0	634.8	564.2	501.5	446.4	400.8	356.1	322.5	283.8
20°	892.8	775.0	676.9	595.2	521.2	454.1	400.0	355.2	307.9	276.1	246.9
22.5°	849.8	732.0	633.1	547.9	472.2	406.0	350.1	306.2	263.2	234.0	202.1
25°	793.9	679.5	578.0	496.3	424.0	357.0	302.8	261.5	224.5	197.8	178.0
27.5°	732.8	619.3	520.4	441.2	373.3	307.1	259.8	222.8	190.9	167.7	146.2
30°	664.0	554.8	461.9	388.8	319.1	261.5	221.1	189.2	161.7	143.6	126.4
32.5°	591.8	486.8	402.5	333.7	271.8	221.9	186.6	160.0	137.6	123.0	108.4
35°	512.6	421.5	344.1	281.3	228.8	186.6	156.5	135.0	117.0	105.8	92.9
37.5°	439.5	357.8	289.0	234.0	190.1	154.8	131.6	113.5	98.9	90.3	80.0
40°	367.3	293.3	237.4	191.8	155.7	128.2	109.2	95.5	83.4	76.6	70.5
42.5°	299.3	241.7	192.7	154.8	126.4	105.8	89.5	77.4	67.9	62.8	55.9
45°	238.3	190.9	151.4	123.0	98.1	80.9	68.8	60.2	53.3	49.9	43.9
47.5°	174.6	135.9	109.2	85.2	70.5	58.5	50.7	45.6	41.3	39.6	37.0
50°	106.7	82.6	67.9	55.0	48.2	43.0	39.6	37.0	33.5	31.0	27.5
52.5°	58.5	49.0	44.7	40.4	37.8	34.4	31.8	29.2	25.8	24.1	21.5
55°	39.6	37.8	36.1	32.7	30.1	26.7	24.1	22.4	20.6	18.9	17.2
57.5°	32.7	31.0	28.4	25.8	23.2	20.6	18.9	18.1	15.5	14.6	12.9
60°	25.8	24.1	22.4	20.6	18.9	16.3	15.5	13.8	12.0	10.3	9.5
62.5°	19.8	18.1	17.2	15.5	13.8	12.0	11.2	9.5	8.6	6.9	6.0
65°	14.6	13.8	12.0	11.2	9.5	8.6	7.7	6.0	5.2	4.3	3.4
67.5°	10.3	9.5	8.6	6.9	6.0	5.2	4.3	3.4	2.6	2.6	1.7
70°	6.0	5.2	5.2	4.3	3.4	2.6	2.6	1.7	1.7	1.7	1.7
72.5°	3.4	2.6	2.6	2.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
75°	1.7	1.7	1.7	1.7	1.7	1.7	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	1.7
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°	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5	605.5
2.5°	559.9	555.6	562.5	537.6	533.3	534.1	529.8	519.5	511.8	510.9	504.0
5°	509.2	498.0	488.6	467.9	459.3	454.1	445.5	431.8	423.2	420.6	411.1
7.5°	455.9	440.4	427.5	400.8	391.4	384.5	370.7	357.8	344.9	341.5	327.7
10°	406.0	383.6	369.9	338.0	326.0	318.2	300.2	289.9	278.7	271.8	264.9
12.5°	351.8	330.3	310.5	285.6	270.9	261.5	246.0	234.0	227.1	221.1	212.5
15°	300.2	279.5	261.5	237.4	224.5	215.0	202.1	191.8	184.9	179.8	173.7
17.5°	254.6	234.8	217.6	197.8	185.8	178.0	168.6	154.0	152.2	149.7	146.2
20°	215.0	197.0	182.3	165.1	155.7	149.7	141.1	134.2	128.2	125.6	120.4
22.5°	180.6	165.1	153.1	139.3	132.5	126.4	119.6	115.3	108.4	106.7	103.2
25°	153.1	141.1	131.6	119.6	114.4	108.4	102.4	98.1	93.8	92.0	89.5
27.5°	129.0	121.3	113.5	103.2	98.1	94.6	88.6	85.2	81.7	80.0	78.3
30°	112.7	104.1	98.1	89.5	86.0	82.6	78.3	74.8	72.3	69.7	68.8
32.5°	98.1	91.2	86.9	79.1	76.6	73.1	69.7	66.2	63.6	61.9	59.3
35°	85.2	79.1	75.7	69.7	67.9	63.6	60.2	57.6	55.0	53.3	51.6
37.5°	73.1	68.8	66.2	60.2	58.5	55.0	51.6	49.9	47.3	45.6	43.9
40°	61.9	58.5	55.0	50.7	48.2	45.6	43.0	41.3	39.6	38.7	37.0
42.5°	50.7	47.3	44.7	41.3	39.6	37.8	35.3	33.5	32.7	31.0	29.2
45°	40.4	38.7	36.1	32.7	31.8	29.2	26.7	25.8	24.1	22.4	21.5
47.5°	32.7	30.1	28.4	24.9	23.2	21.5	20.6	18.9	18.1	17.2	16.3
50°	24.9	23.2	21.5	19.8	18.1	17.2	15.5	13.8	12.9	12.0	11.2
52.5°	19.8	18.1	17.2	14.6	13.8	12.0	11.2	9.5	8.6	7.7	6.9
55°	15.5	13.8	12.9	10.3	9.5	7.7	6.9	6.0	5.2	4.3	3.4
57.5°	11.2	9.5	8.6	6.9	6.0	5.2	3.4	2.6	1.7	1.7	0.9
60°	7.7	6.9	5.2	4.3	3.4	2.6	1.7	0.9	0.9	0.9	0.9
62.5°	5.2	4.3	3.4	2.6	1.7	1.7	1.7	0.9	0.9	0.9	0.9
65°	2.6	1.7	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9
67.5°	1.7	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9
70°	1.7	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9
72.5°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.9
75°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.0
77.5°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.0
80°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.0
82.5°	1.7	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.0
85°	1.7	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.9	0.0
87.5°	1.7	1.7	1.7	0.9	0.9	0.9	0.9	0.9	0.9	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°	605.5	605.5	605.5	605.5
2.5°	514.4	507.5	495.4	492.0
5°	416.3	411.1	403.4	397.4
7.5°	330.3	324.3	320.8	314.8
10°	263.2	258.0	254.6	248.6
12.5°	213.3	208.2	203.0	201.3
15°	173.7	171.2	165.1	164.3
17.5°	142.8	140.2	138.5	135.9
20°	122.1	118.7	116.1	114.4
22.5°	104.1	101.5	98.9	98.9
25°	88.6	87.7	86.0	85.2
27.5°	78.3	77.4	75.7	74.8
30°	69.7	67.9	67.1	66.2
32.5°	60.2	58.5	57.6	57.6
35°	51.6	49.9	49.0	49.0
37.5°	44.7	43.0	42.1	42.1
40°	37.0	36.1	36.1	36.1
42.5°	30.1	28.4	28.4	28.4
45°	21.5	20.6	20.6	20.6
47.5°	16.3	15.5	14.6	14.6
50°	11.2	10.3	10.3	9.5
52.5°	6.9	6.0	5.2	5.2
55°	2.6	2.6	1.7	1.7
57.5°	0.9	0.0	0.0	0.0
60°	0.9	0.0	0.0	0.0
62.5°	0.9	0.9	0.0	0.0
65°	0.9	0.0	0.0	0.0
67.5°	0.9	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)