

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: P130168

Luminaire Tested: **HL612ICAT - HLM6940 - HL6FL - 455SN**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P130168  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P33450)  
Test Lab: INNOVATION CENTER-P3  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: HL612ICAT - HLM6940 - HL6FL - 455SN  
Description: HALO ALLSLOPE 6" 21W, Satin Nickel Reflector, Satin Nickel Metal Trim Ring using 40 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: 1695.0 lumens  
Efficiency: N/A  
Efficacy: 88.7 lumens/watt  
Spacing Criteria (0/90/45): 1.56 / 0.66 / 1.06  
Luminous Opening: Vertical Cylinder (Dia: 0.48' x H: 0.1')  
CIE Type: Direct

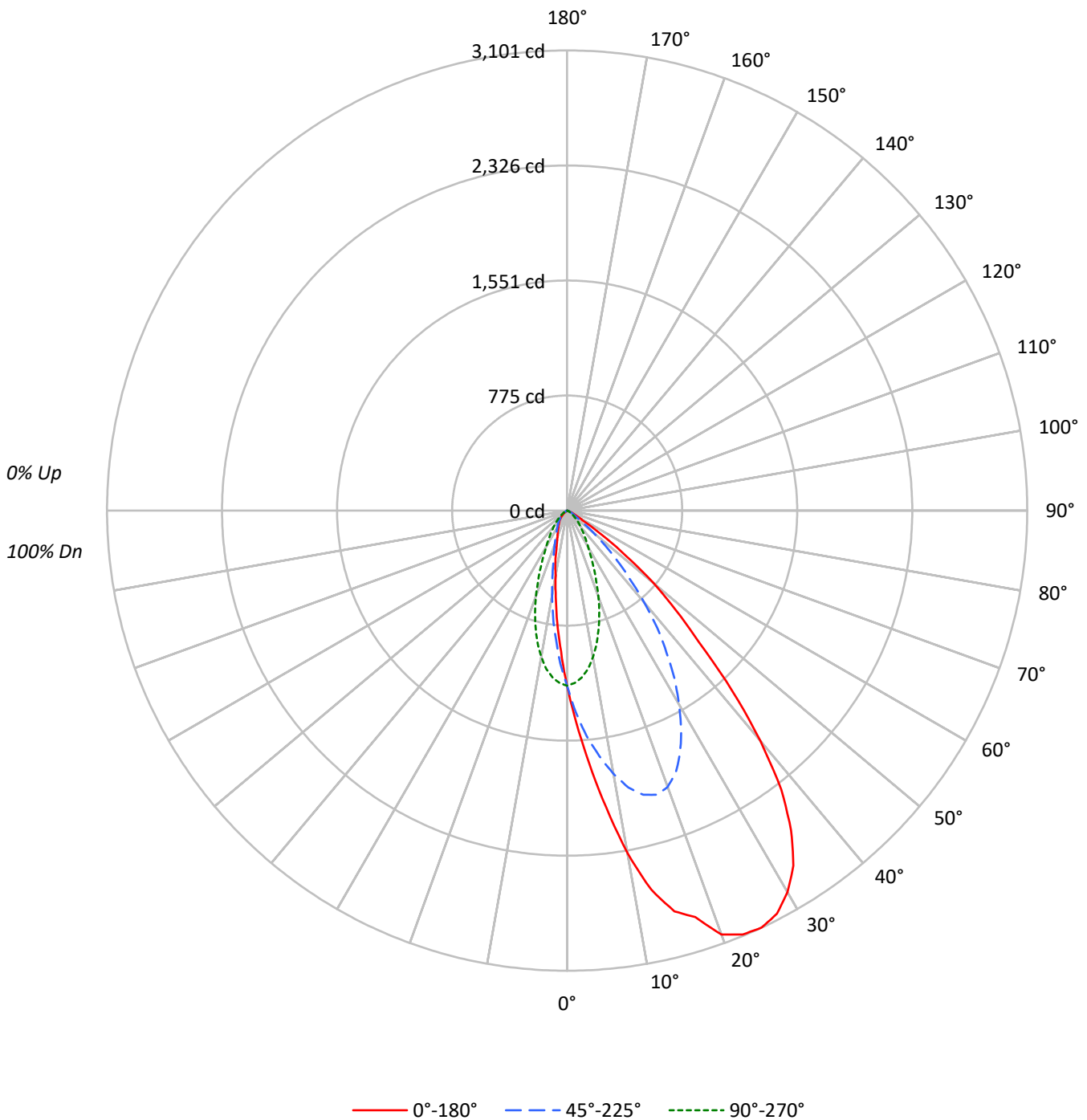
Input Watts (W): 19.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



TEST NUMBER: P130168

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455SN

### 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	101	96	92	104	99	95	91	95	92	89	92	90	87	90	87	85	84					84			
3	100	92	87	82	98	91	86	81	88	84	80	86	82	79	83	80	78	76					76			
4	94	85	79	74	92	84	78	73	81	76	72	79	75	72	77	74	71	69					69			
5	88	78	72	67	86	77	71	66	75	70	66	74	69	65	72	68	65	63					63			
6	83	72	66	61	81	72	65	60	70	64	60	68	63	60	67	63	59	57					57			
7	78	67	60	55	76	66	60	55	65	59	55	64	59	55	63	58	54	53					53			
8	73	62	56	51	72	62	55	51	61	55	51	60	54	50	58	54	50	49					49			
9	69	58	51	47	68	58	51	47	57	51	47	56	50	47	55	50	46	45					45			
10	65	54	48	43	64	54	48	43	53	47	43	52	47	43	51	47	43	42					42			

**AVERAGE LUMINANCE (cd/sqm):**

	0°	90°	180°
0°	70459	70459	70459
5°	100016	66135	44416
10°	135773	58032	25823
15°	161275	47288	16211
20°	176047	35661	11115
25°	181702	24671	8474
30°	177473	16899	6812
35°	161674	12134	5640
40°	128907	8863	4492
45°	83794	6309	3095
50°	53425	4182	2024
55°	21478	2867	981
60°	6213	1897	679
65°	3671	999	414
70°	1775	464	282
75°	324	324	220
80°	123	261	123
85°	0	322	0



TEST NUMBER: P130168

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455SN

**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	113.3	6.7
10°-20°	330.3	19.5
20°-30°	465.2	27.4
30°-40°	438.1	25.8
40°-50°	253.3	14.9
50°-60°	73.6	4.3
60°-70°	16.8	1.0
70°-80°	3.3	0.2
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°	908.8	53.6
0°-40°	1346.9	79.5
0°-60°	1673.9	98.8
0°-90°	1695.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1695.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	1180	1180	1180	1180	1180	
5°	1708	1527	1129	869	758	183
15°	2796	1982	820	361	281	787
25°	3101	1801	421	175	145	1418
35°	2632	1168	198	106	92	1612
45°	1256	479	95	57	46	1010
55°	285	75	38	20	13	292
65°	41	26	11	6	5	43
75°	3	3	3	2	2	6
85°	0	1	2	1	0	0
90°	0	0	0	0	0	



TEST NUMBER: P130168

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455SN

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4
2.5°	1429.8	1417.7	1428.9	1402.9	1421.4	1384.4	1376.9	1370.4	1370.4	1364.0	1328.7
5°	1708.0	1680.1	1694.0	1664.4	1669.9	1612.5	1595.8	1567.9	1555.0	1527.1	1468.7
7.5°	2019.5	1987.1	1990.8	1937.0	1939.8	1862.8	1807.2	1773.8	1728.4	1669.0	1590.2
10°	2345.0	2314.4	2316.2	2267.1	2234.6	2129.8	2043.6	1975.0	1894.3	1801.6	1689.4
12.5°	2616.6	2596.2	2585.1	2523.0	2475.7	2361.7	2258.7	2154.9	2045.5	1911.9	1759.0
15°	2795.6	2794.7	2791.0	2714.9	2666.7	2534.1	2429.3	2297.7	2157.7	1982.4	1795.1
17.5°	2872.6	2932.8	2931.0	2849.4	2794.7	2655.6	2537.8	2385.8	2218.9	2008.4	1828.5
20°	3039.5	3025.5	3021.8	2931.9	2876.3	2727.0	2592.5	2418.2	2225.4	1981.5	1744.1
22.5°	3091.4	3075.6	3066.3	2970.8	2909.6	2752.9	2599.0	2398.7	2175.3	1911.9	1666.2
25°	3100.7	3080.3	3069.1	2967.1	2897.6	2725.1	2548.0	2317.1	2066.8	1800.7	1561.5
27.5°	3061.7	3040.4	3014.4	2915.2	2835.5	2645.4	2437.7	2181.8	1911.9	1665.3	1430.7
30°	2969.9	2951.4	2927.3	2823.4	2723.3	2508.2	2269.9	1976.9	1713.5	1506.7	1281.4
32.5°	2837.3	2811.4	2785.4	2657.4	2536.9	2302.3	2048.2	1768.2	1534.6	1347.3	1139.6
35°	2631.5	2619.4	2572.1	2424.7	2284.7	2024.1	1793.3	1561.5	1379.7	1168.3	977.3
37.5°	2370.9	2396.0	2302.3	2137.3	1978.7	1739.5	1559.6	1347.3	1178.5	995.8	817.8
40°	2023.2	2002.8	1940.7	1791.4	1662.5	1478.9	1323.2	1142.3	969.0	807.6	650.9
42.5°	1647.7	1615.2	1582.8	1459.5	1349.1	1181.3	1040.4	883.6	749.2	625.0	491.4
45°	1256.4	1252.7	1218.4	1120.1	1043.1	921.7	812.3	702.8	589.7	479.4	364.4
47.5°	991.2	988.4	948.6	881.8	824.3	723.2	633.3	540.6	435.8	344.0	268.0
50°	757.5	759.4	728.8	680.6	617.5	538.7	457.1	372.7	286.5	226.2	179.0
52.5°	499.8	506.3	488.6	439.5	385.7	319.0	257.8	203.1	158.6	128.9	102.0
55°	284.7	272.6	252.2	229.0	188.2	143.7	119.6	100.1	87.2	75.1	66.8
57.5°	128.9	128.0	117.8	103.8	89.9	78.8	71.4	64.9	61.2	56.6	52.9
60°	76.0	75.1	73.3	68.6	64.0	59.3	54.7	51.0	49.1	45.4	41.7
62.5°	55.6	54.7	53.8	51.0	48.2	44.5	42.7	41.7	38.0	35.2	32.5
65°	40.8	39.9	39.9	38.0	36.2	34.3	32.5	30.6	27.8	26.0	24.1
67.5°	29.7	28.7	28.7	26.9	25.0	24.1	22.3	20.4	19.5	17.6	16.7
70°	17.6	17.6	17.6	16.7	15.8	13.9	13.0	12.1	11.1	10.2	9.3
72.5°	8.3	9.3	8.3	8.3	7.4	7.4	6.5	6.5	5.6	5.6	4.6
75°	2.8	3.7	3.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
77.5°	0.9	0.9	0.9	0.9	0.9	0.9	1.9	1.9	1.9	1.9	1.9
80°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.9	1.9
82.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.9
85°	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
87.5°	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P130168

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455SN

**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4
2.5°	1322.2	1285.1	1270.3	1259.2	1229.5	1216.5	1190.6	1162.7	1142.3	1129.4	1104.3
5°	1442.8	1381.6	1341.7	1310.2	1259.2	1225.8	1196.1	1129.4	1090.4	1060.8	1020.0
7.5°	1543.8	1457.6	1392.7	1336.1	1262.9	1209.1	1158.1	1075.6	1020.0	978.2	922.6
10°	1611.5	1502.1	1413.1	1333.4	1238.8	1167.4	1097.8	1002.3	930.9	877.2	818.7
12.5°	1654.2	1515.1	1404.8	1305.5	1191.5	1103.4	1019.0	918.0	837.3	769.6	708.4
15°	1660.7	1499.3	1369.5	1249.9	1120.1	1021.8	927.2	819.7	734.4	667.6	590.6
17.5°	1635.6	1453.0	1303.7	1170.2	1033.9	928.2	825.2	719.5	634.2	553.6	484.9
20°	1576.3	1378.8	1219.3	1074.7	936.5	826.2	721.4	615.7	530.4	453.4	396.9
22.5°	1491.9	1286.1	1117.3	969.9	833.6	718.6	618.5	510.0	429.3	371.8	328.2
25°	1379.7	1172.0	1003.3	857.7	719.5	608.3	512.8	421.0	351.4	309.7	273.5
27.5°	1223.0	1045.9	880.9	740.9	616.6	502.6	416.3	343.1	294.9	259.6	230.0
30°	1105.3	912.4	758.5	626.8	504.4	408.9	340.3	282.8	246.6	217.0	192.9
32.5°	958.8	778.9	637.9	513.7	405.2	333.8	281.9	237.4	205.8	184.5	166.0
35°	808.5	651.8	517.4	408.0	327.3	275.4	234.6	197.5	173.4	155.8	141.9
37.5°	666.7	522.0	403.3	321.7	267.0	223.5	191.9	165.0	146.5	133.5	122.4
40°	523.0	401.5	312.5	255.0	212.3	181.7	158.6	139.1	124.2	114.0	106.6
42.5°	391.3	301.3	244.8	203.1	172.5	151.1	133.5	117.8	105.7	98.3	89.9
45°	293.9	233.7	193.8	164.1	139.1	122.4	107.6	94.6	85.3	78.8	73.3
47.5°	219.8	176.2	146.5	123.3	104.8	91.8	81.6	72.3	66.8	64.0	60.3
50°	147.4	118.7	100.1	85.3	75.1	67.7	63.1	59.3	55.6	52.9	50.1
52.5°	89.9	76.0	68.6	61.2	58.4	55.6	51.9	48.2	43.6	41.7	38.9
55°	62.1	56.6	53.8	50.1	47.3	44.5	40.8	38.0	35.2	34.3	31.5
57.5°	50.1	46.4	43.6	39.9	37.1	35.2	33.4	30.6	27.8	26.9	25.0
60°	38.9	36.2	34.3	31.5	29.7	27.8	26.0	23.2	21.3	19.5	17.6
62.5°	30.6	27.8	26.0	24.1	22.3	20.4	18.5	16.7	14.8	13.9	12.1
65°	23.2	20.4	18.5	16.7	14.8	13.9	12.1	11.1	9.3	9.3	7.4
67.5°	14.8	13.0	12.1	11.1	10.2	8.3	7.4	6.5	6.5	5.6	5.6
70°	8.3	7.4	6.5	6.5	5.6	5.6	4.6	4.6	3.7	3.7	3.7
72.5°	4.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7	2.8	2.8	2.8
75°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
77.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
80°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
82.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
85°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
87.5°	0.9	0.9	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P130168

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455SN

**CANDELA DISTRIBUTION (continued):**

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4	1180.4
2.5°	1102.5	1073.7	1048.7	1045.0	1030.2	1032.9	1011.6	992.1	1010.7	966.2	966.2
5°	1001.4	961.5	920.7	905.0	879.0	868.8	843.8	822.5	814.1	784.4	778.9
7.5°	896.6	844.7	795.6	771.5	737.1	725.1	694.5	665.8	645.4	622.2	611.0
10°	775.2	720.5	669.5	641.6	601.8	579.5	549.8	515.5	509.0	471.0	462.7
12.5°	656.5	597.1	548.9	512.8	475.7	457.1	425.6	403.3	387.6	365.3	358.8
15°	541.5	485.9	437.7	409.8	377.4	360.7	340.3	322.7	310.6	294.9	289.3
17.5°	442.3	391.3	353.3	332.9	309.7	294.9	280.0	263.3	255.0	242.0	236.4
20°	357.0	322.7	289.3	272.6	255.9	243.9	231.8	217.9	213.3	204.0	199.4
22.5°	300.4	271.7	242.9	227.2	213.3	206.8	196.6	185.4	181.7	173.4	171.5
25°	250.4	223.5	204.9	193.8	182.7	175.2	166.9	158.6	155.8	149.3	148.4
27.5°	209.6	191.0	175.2	166.0	155.8	151.1	144.6	138.2	140.0	131.7	129.8
30°	176.2	163.2	150.2	143.7	135.4	132.6	128.0	122.4	119.6	116.8	116.8
32.5°	153.9	140.9	130.7	126.1	119.6	118.7	115.0	109.4	110.3	105.7	104.8
35°	133.5	122.4	115.9	111.3	107.6	105.7	102.9	98.3	97.4	94.6	93.7
37.5°	115.9	107.6	102.0	99.2	95.5	93.7	90.9	85.3	86.2	83.5	82.5
40°	101.1	94.6	89.0	87.2	82.5	81.6	78.8	74.2	74.2	71.4	71.4
42.5°	85.3	80.7	75.1	72.3	69.5	68.6	66.8	63.1	62.1	60.3	59.3
45°	70.5	65.8	63.1	60.3	58.4	56.6	54.7	51.9	51.0	49.1	48.2
47.5°	58.4	54.7	51.0	49.1	46.4	45.4	43.6	41.7	40.8	38.9	38.0
50°	47.3	43.6	40.8	38.9	37.1	37.1	35.2	32.5	31.5	30.6	29.7
52.5°	37.1	35.2	33.4	31.5	29.7	28.7	26.9	24.1	23.2	22.3	21.3
55°	29.7	27.8	25.0	24.1	21.3	20.4	18.5	17.6	15.8	14.8	14.8
57.5°	23.2	20.4	18.5	16.7	14.8	14.8	13.0	12.1	11.1	10.2	10.2
60°	16.7	13.9	13.0	11.1	10.2	9.3	9.3	8.3	8.3	7.4	7.4
62.5°	11.1	9.3	8.3	8.3	7.4	7.4	6.5	6.5	6.5	6.5	6.5
65°	7.4	6.5	6.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
67.5°	5.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7
70°	3.7	3.7	3.7	3.7	3.7	3.7	3.7	2.8	2.8	2.8	2.8
72.5°	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	1.9	1.9
75°	2.8	2.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
77.5°	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.9	0.9	0.9	0.9
80°	1.9	1.9	1.9	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
82.5°	1.9	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
85°	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0
87.5°	1.9	0.9	0.9	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





TEST NUMBER: P130168

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455SN

**CANDELA DISTRIBUTION (continued):**

	165°	170°	175°	180°
0°	1180.4	1180.4	1180.4	1180.4
2.5°	973.6	968.0	960.6	949.5
5°	782.6	758.5	765.9	758.5
7.5°	618.5	597.1	595.3	586.9
10°	460.8	450.6	445.1	446.0
12.5°	360.7	349.6	344.9	369.0
15°	290.2	279.1	279.1	281.0
17.5°	234.6	230.0	228.1	226.2
20°	198.4	194.7	191.9	191.9
22.5°	169.7	166.9	164.1	166.0
25°	147.4	144.6	143.7	144.6
27.5°	130.7	128.0	125.2	127.0
30°	116.8	115.0	114.0	114.0
32.5°	105.7	103.8	102.9	102.9
35°	94.6	91.8	91.8	91.8
37.5°	82.5	80.7	80.7	81.6
40°	71.4	66.8	69.5	70.5
42.5°	59.3	57.5	57.5	58.4
45°	47.3	46.4	46.4	46.4
47.5°	38.0	37.1	36.2	37.1
50°	28.7	27.8	27.8	28.7
52.5°	20.4	19.5	19.5	19.5
55°	13.9	13.9	13.0	13.0
57.5°	10.2	9.3	9.3	9.3
60°	7.4	7.4	7.4	8.3
62.5°	6.5	6.5	6.5	6.5
65°	5.6	5.6	4.6	4.6
67.5°	3.7	3.7	3.7	3.7
70°	2.8	2.8	2.8	2.8
72.5°	1.9	1.9	1.9	1.9
75°	1.9	1.9	1.9	1.9
77.5°	0.9	0.9	0.9	0.9
80°	0.9	0.9	0.9	0.9
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)