

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: P130172

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

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P130172
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P33451)
Test Lab: INNOVATION CENTER-P3
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: HL612ICAT - HLM6940 - HL6FL - 455TBZ
Description: HALO ALLSLOPE 6" 21W, Tuscan Bronze Reflector, Tuscan Bronze 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: 1654.2 lumens
Efficiency: N/A
Efficacy: 86.6 lumens/watt
Spacing Criteria (0/90/45): 1.55 / 0.65 / 1.05
Luminous Opening: Vertical Cylinder (Dia: 0.48' x H: 0.1')
CIE Type: Direct

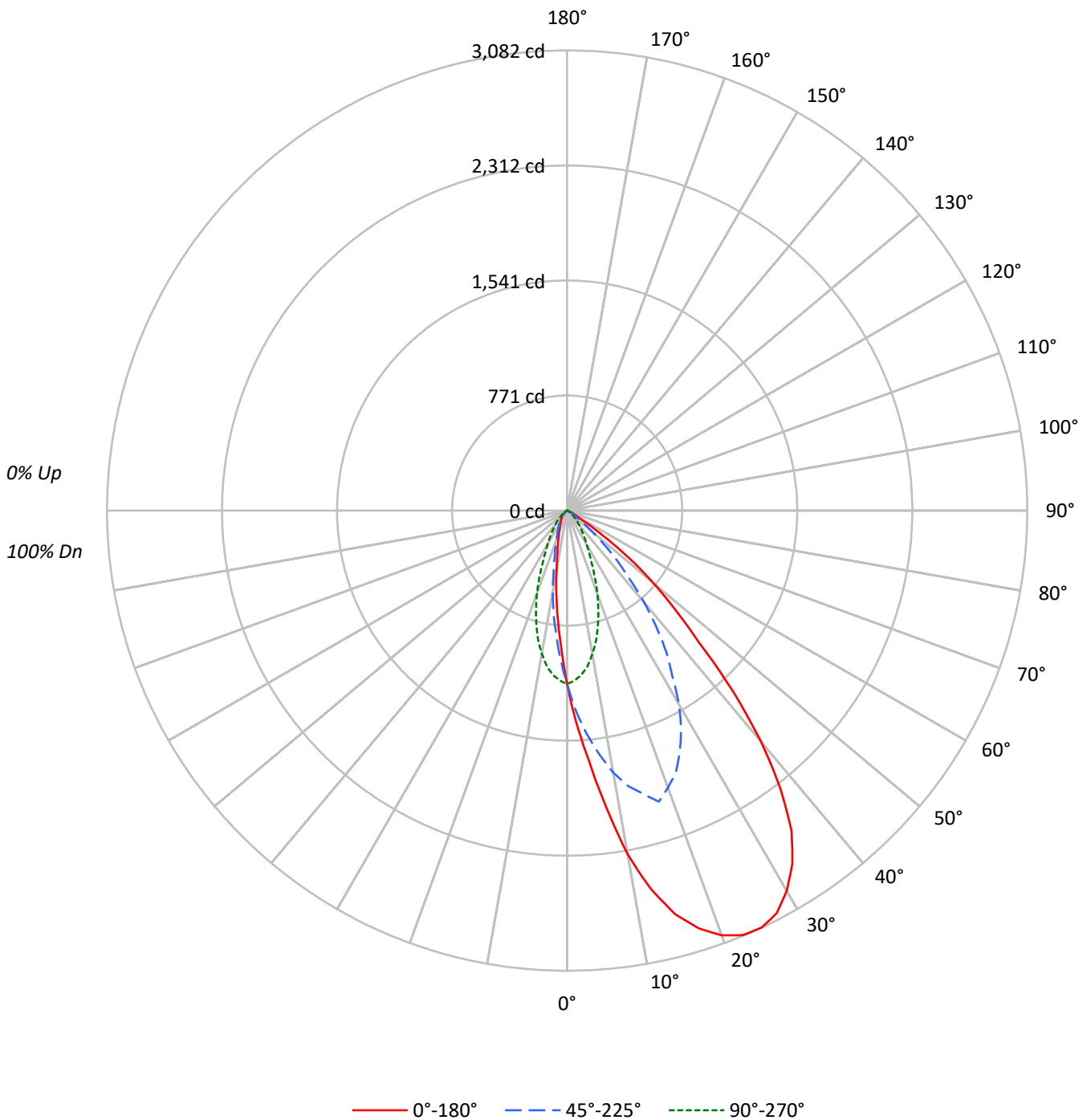
Input Watts (W): 19.1
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	100	100	98	97	96	95	94	92					92			
2	106	101	96	92	104	99	95	91	96	92	89	93	90	87	90	88	85	84					84			
3	100	93	87	82	98	91	86	82	88	84	80	86	82	79	84	80	78	76					76			
4	94	85	79	74	92	84	78	74	82	77	73	80	75	72	78	74	71	69					69			
5	88	79	72	67	86	78	71	67	76	70	66	74	69	65	72	68	65	63					63			
6	83	73	66	61	81	72	65	61	70	65	60	69	64	60	67	63	59	58					58			
7	78	67	61	56	76	67	60	56	65	60	55	64	59	55	63	58	55	53					53			
8	73	63	56	51	72	62	56	51	61	55	51	60	55	51	59	54	50	49					49			
9	69	58	52	47	68	58	52	47	57	51	47	56	51	47	55	50	47	45					45			
10	66	55	48	44	64	54	48	44	53	48	44	52	47	43	52	47	43	42					42			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	69343	69343	69343
5°	98646	64659	42454
10°	135489	56417	23513
15°	161419	45840	13799
20°	175329	34207	9024
25°	180595	22819	6522
30°	175686	15627	5097
35°	160973	10936	4215
40°	128659	7856	3192
45°	82980	5315	2041
50°	52833	3399	1044
55°	21960	2308	279
60°	5984	1365	74
65°	3590	585	0
70°	1685	192	0
75°	324	220	0
80°	0	261	0
85°	0	322	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	111.7	6.8
10°-20°	325.6	19.7
20°-30°	458.1	27.7
30°-40°	428.8	25.9
40°-50°	245.1	14.8
50°-60°	68.8	4.2
60°-70°	13.2	0.8
70°-80°	2.1	0.1
80°-90°	0.8	0.0
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°	895.4	54.1
0°-40°	1324.2	80.1
0°-60°	1638.1	99.0
0°-90°	1654.2	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1654.2	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	1162	1162	1162	1162	1162	
5°	1685	1499	1104	834	725	181
15°	2798	1964	795	324	239	790
25°	3082	1784	389	145	111	1409
35°	2620	1159	178	83	69	1599
45°	1244	470	80	42	31	1003
55°	291	71	31	11	4	300
65°	40	23	6	1	0	41
75°	3	1	2	1	0	5
85°	0	1	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°	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7
2.5°	1420.4	1412.0	1432.4	1404.6	1378.7	1384.2	1380.5	1371.2	1366.6	1340.6	1304.5
5°	1684.6	1684.6	1697.6	1661.4	1624.3	1621.6	1629.9	1574.3	1553.0	1499.2	1444.5
7.5°	2001.7	2009.1	2014.7	1955.3	1908.1	1872.8	1818.1	1775.5	1727.3	1645.7	1566.9
10°	2340.1	2342.0	2345.7	2263.1	2202.0	2147.3	2062.9	1985.0	1893.2	1782.0	1664.2
12.5°	2596.9	2609.0	2615.5	2524.6	2447.6	2377.2	2280.8	2172.3	2054.5	1889.5	1730.0
15°	2798.1	2808.3	2820.4	2725.8	2630.3	2563.5	2448.6	2321.6	2159.3	1963.7	1768.1
17.5°	2933.5	2952.0	2963.1	2862.1	2763.8	2684.1	2559.8	2405.9	2227.9	2044.3	1769.0
20°	3027.1	3046.6	3051.2	2950.2	2841.7	2759.2	2616.4	2442.1	2234.4	1973.9	1725.4
22.5°	3077.2	3092.9	3101.3	2989.1	2874.1	2781.4	2621.0	2418.0	2181.6	1900.6	1646.6
25°	3081.8	3101.3	3103.1	2979.8	2857.4	2750.8	2567.2	2334.5	2067.5	1783.8	1538.1
27.5°	3040.1	3059.6	3055.8	2928.8	2794.4	2669.2	2449.5	2195.5	1912.7	1653.1	1412.0
30°	2940.0	3009.5	2956.6	2828.7	2680.4	2531.1	2275.2	1996.1	1737.5	1499.2	1267.4
32.5°	2806.4	2825.0	2808.3	2667.4	2489.4	2318.8	2049.0	1773.6	1554.8	1307.3	1109.8
35°	2620.1	2626.6	2593.2	2431.0	2224.2	2025.8	1783.8	1564.1	1369.4	1158.9	948.5
37.5°	2344.7	2354.0	2318.8	2131.5	1937.7	1751.4	1561.3	1359.2	1170.0	979.1	802.0
40°	2019.3	1999.8	1941.4	1784.7	1628.1	1485.3	1321.2	1143.2	967.0	801.0	626.7
42.5°	1646.6	1633.6	1583.6	1458.4	1311.0	1190.4	1046.7	890.1	750.1	611.0	479.3
45°	1244.2	1254.4	1215.5	1128.3	1026.3	922.5	814.0	697.2	586.0	470.1	356.0
47.5°	978.1	984.6	965.2	888.2	815.0	719.5	633.2	533.1	433.0	332.8	262.4
50°	749.1	760.3	745.4	684.2	614.7	547.0	460.8	359.7	282.8	217.9	173.4
52.5°	530.3	527.5	510.9	452.4	394.0	335.6	259.6	199.3	158.5	124.2	101.1
55°	291.1	290.2	265.2	231.8	186.4	152.1	121.5	96.4	82.5	71.4	62.1
57.5°	130.7	125.2	117.7	101.1	87.2	77.9	68.6	62.1	58.4	52.8	48.2
60°	73.2	73.2	71.4	64.9	61.2	56.6	52.8	49.1	45.4	41.7	38.0
62.5°	53.8	53.8	51.9	49.1	46.4	43.6	40.8	38.0	35.2	32.4	29.7
65°	39.9	38.9	38.9	36.2	34.3	32.4	30.6	28.7	26.0	23.2	21.3
67.5°	26.9	27.8	27.8	25.0	24.1	22.3	21.3	19.5	17.6	15.8	13.9
70°	16.7	16.7	15.8	15.8	13.9	13.0	12.1	11.1	9.3	8.3	7.4
72.5°	8.3	8.3	7.4	7.4	6.5	6.5	5.6	4.6	4.6	3.7	2.8
75°	2.8	2.8	2.8	1.9	1.9	1.9	1.9	1.9	1.9	0.9	0.9
77.5°	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
80°	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
82.5°	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9
85°	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.9
87.5°	0.0	0.0	0.0	0.0	0.0	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



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CANDELA DISTRIBUTION (continued):

	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°
0°	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7
2.5°	1301.7	1272.0	1261.8	1238.7	1218.3	1196.0	1185.8	1138.5	1133.0	1095.9	1079.2
5°	1423.2	1369.4	1336.0	1291.5	1247.9	1203.4	1188.6	1104.2	1079.2	1027.3	993.9
7.5°	1525.1	1471.4	1384.2	1318.4	1250.7	1184.9	1133.0	1049.5	1007.8	945.7	895.6
10°	1594.7	1490.8	1406.5	1320.2	1228.5	1144.1	1069.0	974.4	920.6	848.3	788.1
12.5°	1632.7	1502.9	1396.3	1290.6	1181.2	1081.0	991.1	891.9	826.1	738.0	677.7
15°	1641.0	1489.0	1358.3	1234.9	1112.6	1000.4	901.2	794.6	722.2	636.0	566.5
17.5°	1617.9	1447.3	1295.2	1162.6	1024.5	908.6	805.7	693.5	614.7	535.0	458.9
20°	1558.5	1374.0	1214.6	1069.0	924.4	805.7	700.0	590.6	509.0	431.1	369.9
22.5°	1466.7	1279.5	1112.6	964.2	818.7	701.8	589.7	485.8	410.7	344.9	302.2
25°	1335.1	1165.4	1000.4	850.2	707.4	596.1	485.8	389.4	331.9	282.8	248.5
27.5°	1226.6	1034.7	879.9	731.5	610.1	490.5	389.4	316.2	276.3	235.5	205.8
30°	1094.0	899.3	751.0	618.4	493.2	394.0	316.2	261.5	228.1	193.8	172.4
32.5°	942.9	764.9	627.7	508.1	394.0	318.9	261.5	217.0	188.2	163.2	144.6
35°	788.1	636.9	522.9	398.7	311.5	258.7	213.2	178.0	156.7	136.3	122.4
37.5°	649.0	505.3	389.4	311.5	249.4	208.6	174.3	149.3	131.7	115.0	104.8
40°	507.1	382.9	296.7	245.7	199.3	166.9	144.6	123.3	110.3	97.3	89.0
42.5°	379.2	293.0	235.5	194.7	161.3	138.1	118.7	101.1	91.8	81.6	74.2
45°	281.9	221.6	182.6	153.0	127.9	108.5	92.7	79.7	72.3	64.9	59.3
47.5°	206.8	164.1	134.4	113.1	91.8	80.7	68.6	61.2	56.6	51.0	48.2
50°	137.2	108.5	89.9	77.0	65.8	59.3	52.8	48.2	45.4	41.7	38.0
52.5°	82.5	69.5	61.2	55.6	50.1	47.3	42.6	38.9	36.2	32.4	29.7
55°	56.6	51.9	47.3	44.5	40.8	37.1	33.4	30.6	27.8	26.0	23.2
57.5°	45.4	41.7	38.0	35.2	31.5	29.7	26.9	23.2	21.3	19.5	16.7
60°	35.2	32.4	28.7	27.8	24.1	22.3	19.5	16.7	15.8	13.0	11.1
62.5°	26.9	24.1	21.3	20.4	17.6	15.8	13.0	11.1	9.3	7.4	6.5
65°	19.5	17.6	14.8	13.0	11.1	9.3	8.3	6.5	5.6	3.7	2.8
67.5°	12.1	10.2	9.3	7.4	6.5	5.6	4.6	2.8	2.8	1.9	1.9
70°	6.5	5.6	4.6	3.7	2.8	2.8	1.9	1.9	1.9	1.9	1.9
72.5°	2.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
75°	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
77.5°	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
80°	0.9	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
82.5°	0.9	0.9	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.9
85°	0.9	0.9	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	0.9
87.5°	0.9	0.9	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	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



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CANDELA DISTRIBUTION (continued):

	110°	115°	120°	125°	130°	135°	140°	145°	150°	155°	160°
0°	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7	1161.7
2.5°	1072.7	1051.4	1046.7	1022.6	1016.1	998.5	969.8	941.0	962.4	952.2	956.8
5°	967.9	935.5	920.6	880.8	859.5	834.4	818.7	789.9	776.0	773.2	754.7
7.5°	854.8	816.8	786.2	749.1	736.1	692.6	662.0	635.1	612.8	604.5	585.0
10°	745.4	693.5	657.3	612.8	581.3	548.9	518.3	487.7	470.1	454.3	433.0
12.5°	628.6	575.8	531.3	483.0	446.0	419.1	386.6	362.5	352.3	339.3	328.2
15°	512.7	454.3	417.2	380.1	350.5	324.5	306.0	289.3	277.2	265.2	255.9
17.5°	406.1	364.4	337.5	299.5	280.9	258.7	242.9	229.9	217.9	209.5	202.1
20°	327.3	293.0	269.8	245.7	226.2	207.7	194.7	185.4	178.0	171.5	166.9
22.5°	271.7	242.9	218.8	199.3	185.4	174.3	164.1	153.9	146.5	142.8	139.1
25°	220.7	197.5	180.8	166.9	155.8	144.6	133.5	127.9	124.2	119.6	117.7
27.5°	183.6	166.0	153.0	140.0	130.7	122.4	117.7	110.3	106.6	103.8	102.9
30°	154.8	140.0	128.9	119.6	112.2	106.6	102.0	97.3	94.6	92.7	90.9
32.5°	130.7	119.6	111.3	103.8	98.3	94.6	90.9	87.2	85.3	82.5	81.6
35°	112.2	102.9	97.3	90.9	87.2	83.4	80.7	77.9	76.0	73.2	72.3
37.5°	96.4	89.9	85.3	79.7	76.0	73.2	70.5	67.7	65.8	64.0	63.0
40°	84.4	77.9	73.2	68.6	65.8	62.1	59.3	56.6	55.6	53.8	52.8
42.5°	69.5	64.0	60.3	56.6	53.8	51.9	49.1	46.4	45.4	43.6	43.6
45°	55.6	51.9	49.1	46.4	44.5	41.7	38.9	37.1	35.2	34.3	32.4
47.5°	45.4	42.6	39.9	36.2	34.3	31.5	29.7	28.7	26.9	26.0	25.0
50°	36.2	32.4	30.6	27.8	26.0	24.1	23.2	20.4	19.5	18.5	17.6
52.5°	27.8	26.0	24.1	21.3	19.5	17.6	15.8	13.9	13.0	11.1	10.2
55°	21.3	19.5	16.7	14.8	13.0	11.1	10.2	8.3	6.5	5.6	5.6
57.5°	14.8	13.0	11.1	9.3	7.4	6.5	4.6	3.7	2.8	2.8	1.9
60°	9.3	7.4	6.5	4.6	3.7	2.8	1.9	1.9	0.9	0.9	0.9
62.5°	5.6	3.7	2.8	1.9	1.9	0.9	0.9	0.9	0.9	0.9	0.9
65°	2.8	1.9	1.9	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
67.5°	1.9	1.9	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
70°	1.9	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0
72.5°	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0
75°	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0
77.5°	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0
80°	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0
82.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0
85°	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	0.0
87.5°	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	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: P130172

CATALOG NUMBER: HL612ICAT - HLM6940 - HL6FL - 455TBZ

CANDELA DISTRIBUTION (continued):

	165°	170°	175°	180°
0°	1161.7	1161.7	1161.7	1161.7
2.5°	944.8	927.1	927.1	913.2
5°	752.8	728.7	738.9	725.0
7.5°	580.4	564.6	572.0	554.4
10°	430.2	418.1	415.4	406.1
12.5°	322.6	313.4	310.6	302.2
15°	250.3	242.9	242.9	239.2
17.5°	197.5	191.9	192.8	191.9
20°	163.2	158.5	157.6	155.8
22.5°	136.3	131.7	131.7	130.7
25°	115.0	112.2	112.2	111.3
27.5°	100.1	98.3	98.3	97.3
30°	89.0	87.2	87.2	85.3
32.5°	79.7	77.9	78.8	77.9
35°	70.5	69.5	69.5	68.6
37.5°	62.1	60.3	60.3	59.3
40°	51.9	51.0	51.9	50.1
42.5°	41.7	40.8	41.7	40.8
45°	31.5	30.6	31.5	30.6
47.5°	24.1	23.2	22.3	22.3
50°	16.7	15.8	15.8	14.8
52.5°	10.2	9.3	9.3	8.3
55°	4.6	4.6	3.7	3.7
57.5°	1.9	1.9	0.9	0.9
60°	0.9	0.9	0.9	0.9
62.5°	0.9	0.9	0.9	0.0
65°	0.0	0.0	0.0	0.0
67.5°	0.0	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)