

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: P275377

Luminaire Tested: **ML4D09_930 - TIR50AWW25 - TL45R6GMWWB - TL46S6GMWWB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P275377
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-901-18)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_930 - TIR50AWW25 - TL45R6GMWWB - TL46S6GMWWB
Description: ML4 900LM 2700K, 90CRI, 25° ASYMM WW, WITH ROUND ASYMM WW, LINEAR SPREAD LENS, MATTE WHITE FLANGE, WHITE LENS FRAME
Light Source: (1) HIGH LUMEN LED 90CRI / 3000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 690.5 lumens
Efficiency: N/A
Efficacy: 61.1 lumens/watt
Spacing Criteria (0/90/45): 1.33 / 0.78 / 1.1
Luminous Opening: Circular (Dia: 0.17' x H: 0')
CIE Type: Direct

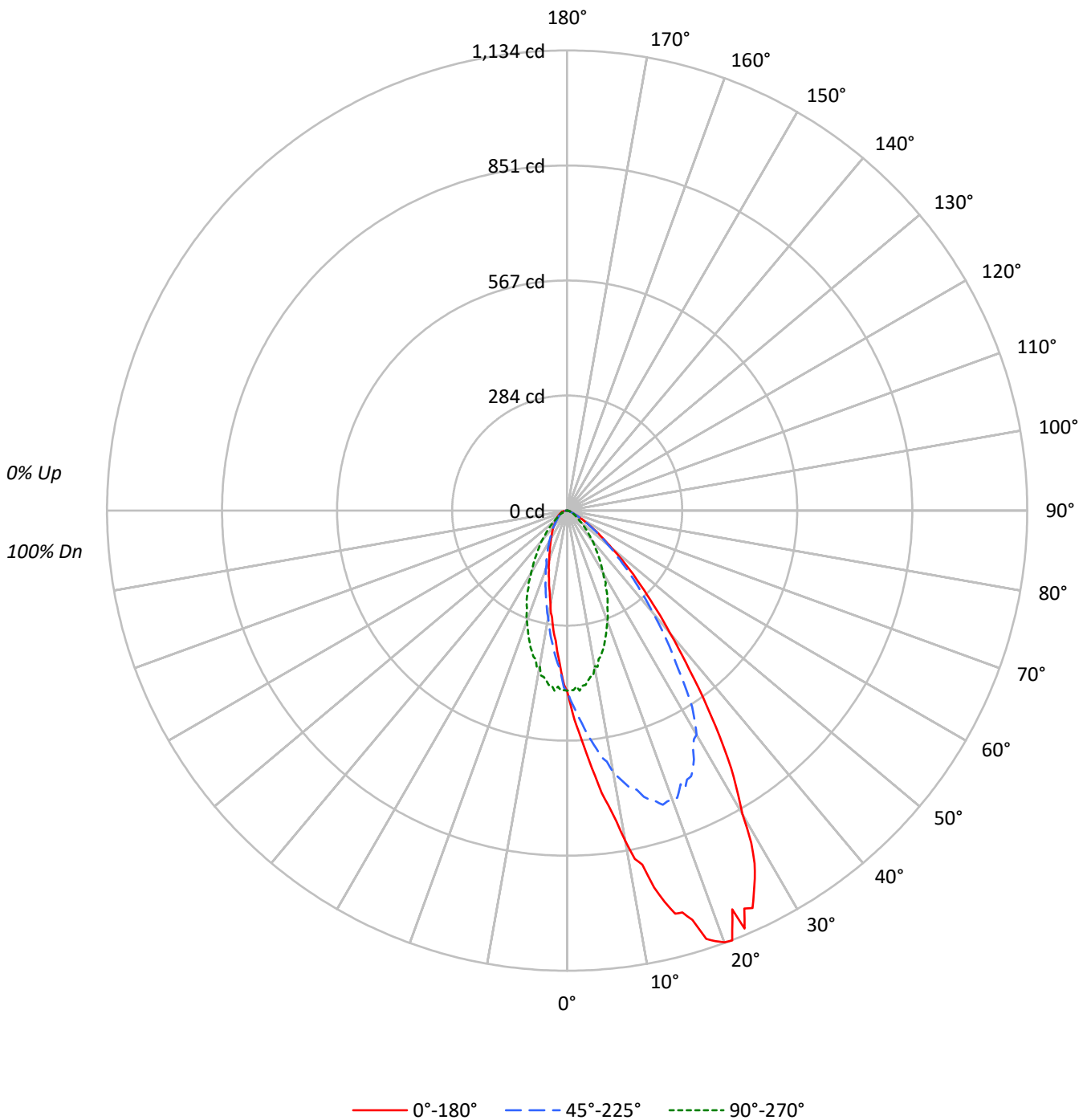
Input Watts (W): 11.3
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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			
1	112	109	106	103	110	107	104	102	103	100	98	99	97	95	95	94	93	91					91			
2	105	99	94	90	103	98	93	89	94	91	87	91	88	85	88	86	84	82					82			
3	99	91	85	80	96	89	84	79	87	82	78	84	80	77	82	78	76	74					74			
4	92	83	77	72	90	82	76	71	80	75	70	78	73	69	76	72	69	67					67			
5	87	77	70	65	85	76	69	64	74	68	64	72	67	63	70	66	63	61					61			
6	81	71	64	59	80	70	63	59	68	62	58	67	62	58	65	61	57	56					56			
7	77	66	59	54	75	65	58	53	64	58	53	62	57	53	61	56	53	51					51			
8	72	61	54	49	71	60	54	49	59	53	49	58	53	49	57	52	48	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	47	42	63	53	46	42	52	46	42	51	46	42	50	45	42	40					40			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	219011	219011	219011
5°	306420	214548	159326
10°	414169	194986	118184
15°	525188	178519	88161
20°	594454	152000	67573
25°	588370	127821	54275
30°	492340	101408	45178
35°	373249	79444	38728
40°	254791	62152	33813
45°	172831	46400	29166
50°	109454	32928	26327
55°	70105	24859	24859
60°	40161	21117	23288
65°	20080	17512	23816
70°	10819	15435	23225
75°	6100	12200	22494
80°	5967	12217	24435
85°	6227	11888	24342



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	43.5	6.3
10°-20°	132.9	19.2
20°-30°	189.3	27.4
30°-40°	161.0	23.3
40°-50°	92.2	13.4
50°-60°	42.8	6.2
60°-70°	18.2	2.6
70°-80°	8.0	1.2
80°-90°	2.7	0.4
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°	365.6	53.0
0°-40°	526.6	76.3
0°-60°	661.7	95.8
0°-90°	690.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	690.5	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	444	444	444	444	444	
5°	619	550	433	354	322	65
15°	1028	730	350	204	173	289
25°	1081	723	235	115	100	481
35°	620	477	132	66	64	386
45°	248	214	66	40	42	196
55°	82	75	29	26	29	75
65°	17	18	15	17	20	20
75°	3	4	6	11	12	4
85°	1	1	2	3	4	1
90°	0	0	0	0	0	



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CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	443.9	443.9	443.9	443.9	443.9	443.9	443.9	443.9	443.9	443.9	443.9
1°	479.3	483.6	468.6	470.7	468.6	468.6	466.4	465.3	462.1	462.1	466.4
2°	515.7	506.1	500.7	484.6	496.4	498.6	491.1	491.1	488.9	475.0	484.6
3°	545.8	546.8	534.0	532.9	520.0	524.3	525.4	523.2	517.9	503.9	506.1
4°	579.0	576.8	569.3	567.2	562.9	562.9	554.3	555.4	545.8	532.9	525.4
5°	618.7	619.7	605.8	597.2	585.4	587.6	584.3	588.6	568.3	556.5	550.0
6°	657.3	658.3	644.4	638.0	626.2	622.9	618.7	616.5	594.0	577.9	570.4
7°	701.2	695.9	683.0	673.3	664.8	657.3	651.9	650.8	624.0	607.9	590.8
8°	734.5	739.8	734.5	705.5	700.1	704.4	685.1	673.3	651.9	631.5	614.4
9°	775.2	782.7	764.5	767.7	735.5	733.4	724.8	704.4	696.9	648.7	626.2
10°	826.7	821.3	804.2	788.1	780.6	774.1	751.6	747.3	716.2	660.5	655.1
11°	874.9	862.0	847.0	841.7	812.7	807.4	773.1	769.8	735.5	695.9	671.2
12°	892.1	912.4	877.1	867.4	850.3	843.8	820.2	795.6	758.0	713.0	688.4
13°	953.2	950.0	939.2	927.5	880.3	874.9	853.5	825.6	784.9	737.7	704.4
14°	993.9	995.0	973.6	951.0	915.7	907.1	883.5	856.7	807.4	753.8	708.7
15°	1028.2	1036.8	999.3	981.1	947.8	937.1	910.3	884.6	831.0	772.0	730.2
16°	1030.4	1052.9	1027.2	1008.9	971.4	965.0	937.1	902.8	846.0	784.9	742.0
17°	1055.0	1085.1	1046.5	1051.8	995.0	983.2	955.3	914.6	873.8	804.2	749.5
18°	1109.7	1101.2	1079.7	1056.1	1015.4	1002.5	980.0	937.1	874.9	791.3	762.3
19°	1122.6	1120.4	1107.6	1072.2	1029.3	1015.4	986.4	941.4	882.4	818.1	758.0
20°	1132.2	1129.0	1108.7	1080.8	1030.4	1019.7	993.9	954.3	893.1	821.3	758.0
21°	1134.4	1151.5	1107.6	1071.1	1039.0	1026.1	996.1	955.3	887.8	820.2	758.0
22.5°	1063.6	1129.0	1114.0	1050.8	1045.4	1027.2	999.3	943.5	881.3	807.4	730.2
23°	1119.4	1125.8	1103.3	1075.4	1029.3	1015.4	984.3	939.2	886.7	809.5	744.1
24°	1073.3	1106.5	1073.3	1059.3	1015.4	1012.2	967.1	932.8	874.9	797.7	725.9
25°	1080.8	1082.9	1055.0	1039.0	997.1	990.7	973.6	912.4	852.4	784.9	722.7
26°	1049.7	1058.3	1031.5	1015.4	990.7	958.5	944.6	892.1	835.2	762.3	707.7
27°	1018.6	1020.7	995.0	982.1	963.9	931.7	908.2	868.5	823.5	738.7	688.4
28°	984.3	984.3	960.7	944.6	910.3	899.6	886.7	840.6	787.0	722.7	660.5
29°	936.0	938.2	918.9	911.4	876.0	862.0	843.8	807.4	766.6	695.9	644.4
30°	864.2	894.2	872.8	861.0	835.2	826.7	820.2	792.4	738.7	674.4	638.0
32.5°	752.7	765.6	752.7	743.0	742.0	716.2	696.9	677.6	649.8	599.4	573.6
35°	619.7	633.7	616.5	625.1	610.1	605.8	598.3	572.6	556.5	514.7	477.1
37.5°	495.4	507.2	503.9	501.8	485.7	485.7	485.7	469.6	454.6	427.8	403.1
40°	395.6	403.1	405.3	403.1	398.9	399.9	381.7	382.8	365.6	350.6	329.2
42.5°	313.1	319.5	317.4	310.9	313.1	307.7	318.4	305.6	303.4	282.0	267.0
45°	247.7	246.6	250.9	248.8	247.7	245.5	243.4	243.4	235.9	226.2	214.4
47.5°	194.1	194.1	194.1	195.1	193.0	191.9	191.9	189.8	187.6	175.8	168.3
50°	142.6	148.0	145.8	145.8	151.2	149.0	146.9	149.0	148.0	138.3	133.0
52.5°	107.2	108.3	110.4	108.3	112.6	110.4	111.5	112.6	109.4	106.1	102.9
55°	81.5	79.3	81.5	81.5	84.7	83.6	82.6	82.6	82.6	78.3	75.1
57.5°	57.9	57.9	60.0	59.0	60.0	59.0	60.0	62.2	60.0	57.9	56.8
60°	40.7	40.7	41.8	42.9	44.0	44.0	44.0	44.0	42.9	41.8	40.7
62.5°	27.9	27.9	27.9	28.9	30.0	28.9	31.1	30.0	30.0	30.0	27.9
65°	17.2	17.2	18.2	18.2	19.3	19.3	19.3	20.4	20.4	19.3	18.2



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	10.7	10.7	10.7	11.8	12.9	11.8	12.9	12.9	12.9	11.8	12.9
70°	7.5	6.4	7.5	7.5	7.5	7.5	7.5	7.5	8.6	8.6	8.6
72.5°	4.3	4.3	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
75°	3.2	3.2	3.2	3.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3
77.5°	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
80°	2.1	2.1	2.1	2.1	3.2	3.2	3.2	3.2	3.2	3.2	3.2
82.5°	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
85°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
87.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
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):

	67.5°	90°	112.5°	135°	157.5°	180°
0°	443.9	443.9	443.9	443.9	443.9	443.9
1°	453.5	442.8	437.5	436.4	426.7	430.0
2°	466.4	442.8	425.7	407.4	402.1	399.9
3°	471.8	434.2	411.7	384.9	380.6	372.1
4°	481.4	445.0	401.0	371.0	353.8	348.5
5°	488.9	433.2	389.2	353.8	333.5	321.7
6°	502.9	432.1	372.1	334.5	306.6	307.7
7°	501.8	421.4	360.3	319.5	290.6	286.3
8°	507.2	413.9	344.2	303.4	274.5	267.0
9°	505.0	411.7	332.4	285.2	261.6	255.2
10°	517.9	389.2	318.4	268.1	246.6	235.9
11°	520.0	392.4	306.6	257.3	231.6	220.9
12°	515.7	374.2	293.8	241.2	217.7	206.9
13°	521.1	368.8	279.8	230.5	204.8	195.1
14°	516.8	358.1	268.1	216.6	191.9	185.5
15°	508.2	349.5	256.3	203.7	183.3	172.6
16°	502.9	335.6	243.4	194.1	173.7	164.0
17°	497.5	324.9	229.5	181.2	161.9	153.3
18°	496.4	312.0	220.9	169.4	152.3	146.9
19°	482.5	301.3	206.9	163.0	144.7	137.2
20°	477.1	289.5	197.3	154.4	137.2	128.7
21°	460.0	279.8	188.7	141.5	129.7	123.3
22.5°	454.6	258.4	172.6	134.0	116.9	113.7
23°	437.5	255.2	168.3	128.7	117.9	109.4
24°	431.0	245.5	160.8	122.2	110.4	105.1
25°	422.4	234.8	150.1	114.7	102.9	99.7
26°	409.6	223.0	140.5	109.4	97.6	94.4
27°	391.4	206.9	133.0	104.0	93.3	90.1
28°	377.4	202.6	127.6	97.6	89.0	86.8
29°	366.7	186.6	116.9	93.3	84.7	82.6
30°	347.4	178.0	112.6	87.9	81.5	79.3
32.5°	308.8	153.3	96.5	76.1	70.8	70.8
35°	273.4	131.9	81.5	66.5	64.3	64.3
37.5°	240.2	112.6	70.8	59.0	56.8	57.9
40°	201.6	96.5	62.2	51.5	51.5	52.5
42.5°	163.0	80.4	52.5	45.0	46.1	47.2
45°	131.9	66.5	46.1	39.7	41.8	41.8
47.5°	105.1	53.6	38.6	35.4	38.6	37.5
50°	79.3	42.9	33.2	32.2	34.3	34.3
52.5°	61.1	35.4	28.9	28.9	31.1	31.1
55°	45.0	28.9	25.7	25.7	27.9	28.9
57.5°	33.2	24.7	22.5	22.5	25.7	26.8
60°	25.7	21.4	19.3	21.4	23.6	23.6
62.5°	20.4	18.2	18.2	19.3	21.4	22.5
65°	15.0	15.0	16.1	17.2	19.3	20.4



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	11.8	12.9	13.9	15.0	17.2	17.2
70°	8.6	10.7	11.8	13.9	15.0	16.1
72.5°	6.4	8.6	9.6	11.8	13.9	13.9
75°	5.4	6.4	8.6	10.7	11.8	11.8
77.5°	4.3	5.4	7.5	8.6	10.7	10.7
80°	3.2	4.3	5.4	7.5	8.6	8.6
82.5°	3.2	3.2	4.3	5.4	6.4	6.4
85°	2.1	2.1	2.1	3.2	4.3	4.3
87.5°	1.1	1.1	1.1	1.1	2.1	2.1
90°	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)