

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: P275376

Luminaire Tested: **ML4D09_927 - TIR50AWW25 - TL45R6GMWWB - TL46S6GMWWB**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P275376
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_927 - 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 / 2700K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 644.1 lumens
Efficiency: N/A
Efficacy: 57.0 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

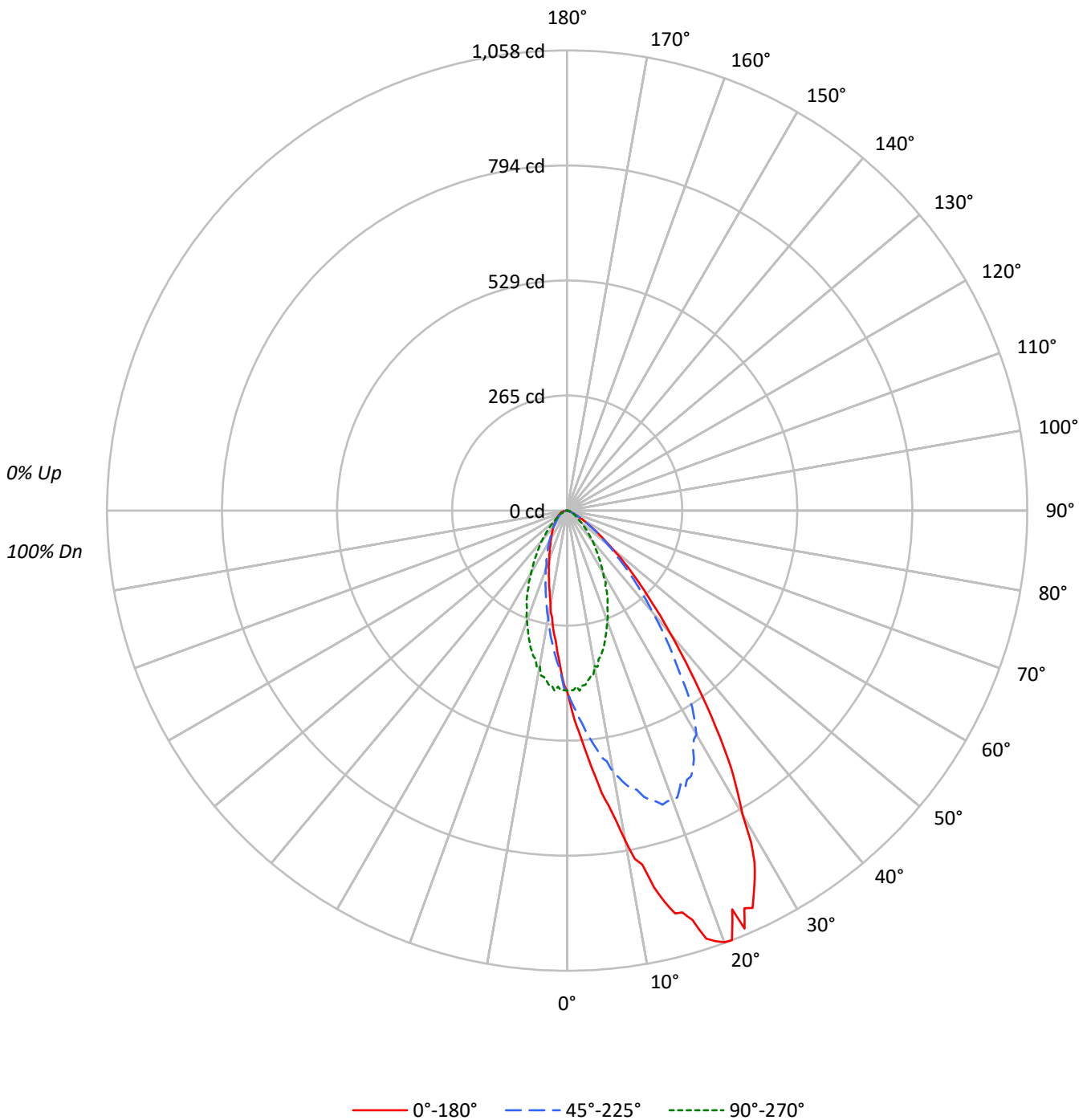
Input Watts (W): 11.3
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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°	204259	204259	204259
5°	285767	200087	148579
10°	386314	181860	110218
15°	489893	166516	82236
20°	554498	141762	63005
25°	548794	119220	50628
30°	459240	94571	42158
35°	348132	74084	36138
40°	237659	57966	31559
45°	161179	43260	27212
50°	102086	30702	24562
55°	65374	23225	23225
60°	37497	19735	21709
65°	18679	16344	22181
70°	10098	14425	21638
75°	5719	11438	20969
80°	5683	11365	22730
85°	5661	11322	22644



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	40.5	6.3
10°-20°	124.0	19.2
20°-30°	176.5	27.4
30°-40°	150.1	23.3
40°-50°	86.0	13.4
50°-60°	39.9	6.2
60°-70°	16.9	2.6
70°-80°	7.5	1.2
80°-90°	2.5	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°	341.0	53.0
0°-40°	491.2	76.3
0°-60°	617.1	95.8
0°-90°	644.1	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	644.1	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	414	414	414	414	414	
5°	577	513	404	330	300	61
15°	959	681	326	190	161	270
25°	1008	674	219	107	93	449
35°	578	445	123	62	60	360
45°	231	200	62	37	39	182
55°	76	70	27	24	27	70
65°	16	17	14	16	19	18
75°	3	4	6	10	11	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°	414.0	414.0	414.0	414.0	414.0	414.0	414.0	414.0	414.0	414.0	414.0
1°	447.0	451.0	437.0	439.0	437.0	437.0	435.0	434.0	431.0	431.0	435.0
2°	481.0	472.0	467.0	452.0	463.0	465.0	458.0	458.0	456.0	443.0	452.0
3°	509.0	510.0	498.0	497.0	485.0	489.0	490.0	488.0	483.0	470.0	472.0
4°	540.0	538.0	531.0	529.0	525.0	525.0	517.0	518.0	509.0	497.0	490.0
5°	577.0	578.0	565.0	557.0	546.0	548.0	545.0	549.0	530.0	519.0	513.0
6°	613.0	614.0	601.0	595.0	584.0	581.0	577.0	575.0	554.0	539.0	532.0
7°	654.0	649.0	637.0	628.0	620.0	613.0	608.0	607.0	582.0	567.0	551.0
8°	685.1	690.1	685.1	658.0	653.0	657.0	639.0	628.0	608.0	589.0	573.0
9°	723.1	730.1	713.1	716.1	686.1	684.0	676.0	657.0	650.0	605.0	584.0
10°	771.1	766.1	750.1	735.1	728.1	722.1	701.1	697.1	668.0	616.0	611.0
11°	816.1	804.1	790.1	785.1	758.1	753.1	721.1	718.1	686.1	649.0	626.0
12°	832.1	851.1	818.1	809.1	793.1	787.1	765.1	742.1	707.1	665.0	642.0
13°	889.1	886.1	876.1	865.1	821.1	816.1	796.1	770.1	732.1	688.1	657.0
14°	927.1	928.1	908.1	887.1	854.1	846.1	824.1	799.1	753.1	703.1	661.0
15°	959.1	967.1	932.1	915.1	884.1	874.1	849.1	825.1	775.1	720.1	681.0
16°	961.1	982.1	958.1	941.1	906.1	900.1	874.1	842.1	789.1	732.1	692.1
17°	984.1	1012.1	976.1	981.1	928.1	917.1	891.1	853.1	815.1	750.1	699.1
18°	1035.1	1027.1	1007.1	985.1	947.1	935.1	914.1	874.1	816.1	738.1	711.1
19°	1047.1	1045.1	1033.1	1000.1	960.1	947.1	920.1	878.1	823.1	763.1	707.1
20°	1056.1	1053.1	1034.1	1008.1	961.1	951.1	927.1	890.1	833.1	766.1	707.1
21°	1058.1	1074.1	1033.1	999.1	969.1	957.1	929.1	891.1	828.1	765.1	707.1
22.5°	992.1	1053.1	1039.1	980.1	975.1	958.1	932.1	880.1	822.1	753.1	681.0
23°	1044.1	1050.1	1029.1	1003.1	960.1	947.1	918.1	876.1	827.1	755.1	694.1
24°	1001.1	1032.1	1001.1	988.1	947.1	944.1	902.1	870.1	816.1	744.1	677.0
25°	1008.1	1010.1	984.1	969.1	930.1	924.1	908.1	851.1	795.1	732.1	674.0
26°	979.1	987.1	962.1	947.1	924.1	894.1	881.1	832.1	779.1	711.1	660.0
27°	950.1	952.1	928.1	916.1	899.1	869.1	847.1	810.1	768.1	689.1	642.0
28°	918.1	918.1	896.1	881.1	849.1	839.1	827.1	784.1	734.1	674.0	616.0
29°	873.1	875.1	857.1	850.1	817.1	804.1	787.1	753.1	715.1	649.0	601.0
30°	806.1	834.1	814.1	803.1	779.1	771.1	765.1	739.1	689.1	629.0	595.0
32.5°	702.1	714.1	702.1	693.1	692.1	668.0	650.0	632.0	606.0	559.0	535.0
35°	578.0	591.0	575.0	583.0	569.0	565.0	558.0	534.0	519.0	480.0	445.0
37.5°	462.0	473.0	470.0	468.0	453.0	453.0	453.0	438.0	424.0	399.0	376.0
40°	369.0	376.0	378.0	376.0	372.0	373.0	356.0	357.0	341.0	327.0	307.0
42.5°	292.0	298.0	296.0	290.0	292.0	287.0	297.0	285.0	283.0	263.0	249.0
45°	231.0	230.0	234.0	232.0	231.0	229.0	227.0	227.0	220.0	211.0	200.0
47.5°	181.0	181.0	181.0	182.0	180.0	179.0	179.0	177.0	175.0	164.0	157.0
50°	133.0	138.0	136.0	136.0	141.0	139.0	137.0	139.0	138.0	129.0	124.0
52.5°	100.0	101.0	103.0	101.0	105.0	103.0	104.0	105.0	102.0	99.0	96.0
55°	76.0	74.0	76.0	76.0	79.0	78.0	77.0	77.0	77.0	73.0	70.0
57.5°	54.0	54.0	56.0	55.0	56.0	55.0	56.0	58.0	56.0	54.0	53.0
60°	38.0	38.0	39.0	40.0	41.0	41.0	41.0	41.0	40.0	39.0	38.0
62.5°	26.0	26.0	26.0	27.0	28.0	27.0	29.0	28.0	28.0	28.0	26.0
65°	16.0	16.0	17.0	17.0	18.0	18.0	18.0	19.0	19.0	18.0	17.0



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	10.0	10.0	10.0	11.0	12.0	11.0	12.0	12.0	12.0	11.0	12.0
70°	7.0	6.0	7.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0
72.5°	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
75°	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
77.5°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80°	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
82.5°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
85°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
87.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
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):

	67.5°	90°	112.5°	135°	157.5°	180°
0°	414.0	414.0	414.0	414.0	414.0	414.0
1°	423.0	413.0	408.0	407.0	398.0	401.0
2°	435.0	413.0	397.0	380.0	375.0	373.0
3°	440.0	405.0	384.0	359.0	355.0	347.0
4°	449.0	415.0	374.0	346.0	330.0	325.0
5°	456.0	404.0	363.0	330.0	311.0	300.0
6°	469.0	403.0	347.0	312.0	286.0	287.0
7°	468.0	393.0	336.0	298.0	271.0	267.0
8°	473.0	386.0	321.0	283.0	256.0	249.0
9°	471.0	384.0	310.0	266.0	244.0	238.0
10°	483.0	363.0	297.0	250.0	230.0	220.0
11°	485.0	366.0	286.0	240.0	216.0	206.0
12°	481.0	349.0	274.0	225.0	203.0	193.0
13°	486.0	344.0	261.0	215.0	191.0	182.0
14°	482.0	334.0	250.0	202.0	179.0	173.0
15°	474.0	326.0	239.0	190.0	171.0	161.0
16°	469.0	313.0	227.0	181.0	162.0	153.0
17°	464.0	303.0	214.0	169.0	151.0	143.0
18°	463.0	291.0	206.0	158.0	142.0	137.0
19°	450.0	281.0	193.0	152.0	135.0	128.0
20°	445.0	270.0	184.0	144.0	128.0	120.0
21°	429.0	261.0	176.0	132.0	121.0	115.0
22.5°	424.0	241.0	161.0	125.0	109.0	106.0
23°	408.0	238.0	157.0	120.0	110.0	102.0
24°	402.0	229.0	150.0	114.0	103.0	98.0
25°	394.0	219.0	140.0	107.0	96.0	93.0
26°	382.0	208.0	131.0	102.0	91.0	88.0
27°	365.0	193.0	124.0	97.0	87.0	84.0
28°	352.0	189.0	119.0	91.0	83.0	81.0
29°	342.0	174.0	109.0	87.0	79.0	77.0
30°	324.0	166.0	105.0	82.0	76.0	74.0
32.5°	288.0	143.0	90.0	71.0	66.0	66.0
35°	255.0	123.0	76.0	62.0	60.0	60.0
37.5°	224.0	105.0	66.0	55.0	53.0	54.0
40°	188.0	90.0	58.0	48.0	48.0	49.0
42.5°	152.0	75.0	49.0	42.0	43.0	44.0
45°	123.0	62.0	43.0	37.0	39.0	39.0
47.5°	98.0	50.0	36.0	33.0	36.0	35.0
50°	74.0	40.0	31.0	30.0	32.0	32.0
52.5°	57.0	33.0	27.0	27.0	29.0	29.0
55°	42.0	27.0	24.0	24.0	26.0	27.0
57.5°	31.0	23.0	21.0	21.0	24.0	25.0
60°	24.0	20.0	18.0	20.0	22.0	22.0
62.5°	19.0	17.0	17.0	18.0	20.0	21.0
65°	14.0	14.0	15.0	16.0	18.0	19.0



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	11.0	12.0	13.0	14.0	16.0	16.0
70°	8.0	10.0	11.0	13.0	14.0	15.0
72.5°	6.0	8.0	9.0	11.0	13.0	13.0
75°	5.0	6.0	8.0	10.0	11.0	11.0
77.5°	4.0	5.0	7.0	8.0	10.0	10.0
80°	3.0	4.0	5.0	7.0	8.0	8.0
82.5°	3.0	3.0	4.0	5.0	6.0	6.0
85°	2.0	2.0	2.0	3.0	4.0	4.0
87.5°	1.0	1.0	1.0	1.0	2.0	2.0
90°	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)