

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: P275383

Luminaire Tested: **ML4D09_940 - TIR50AWW25 - TL41RMW - TL42SMW**

Issue Date: 3/3/2020

Test Information

Test Method: LM-41-14
Report Number: P275383
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-901-19)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: HALO
Catalog Number: ML4D09_940 - TIR50AWW25 - TL41RMW - TL42SMW
Description: ML4 900LM 2700K, 90CRI, 25° ASYMM WW, WITH ROUND PINHOLE MATTE WHITE FLANGE
Light Source: (1) HIGH LUMEN LED 90CRI / 4000K CCT
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 817.4 lumens
Efficiency: N/A
Efficacy: 72.3 lumens/watt
Spacing Criteria (0/90/45): 1.4 / 0.6 / 0.88
Luminous Opening: Circular (Dia: 0.17' x H: 0')
CIE Type: Direct

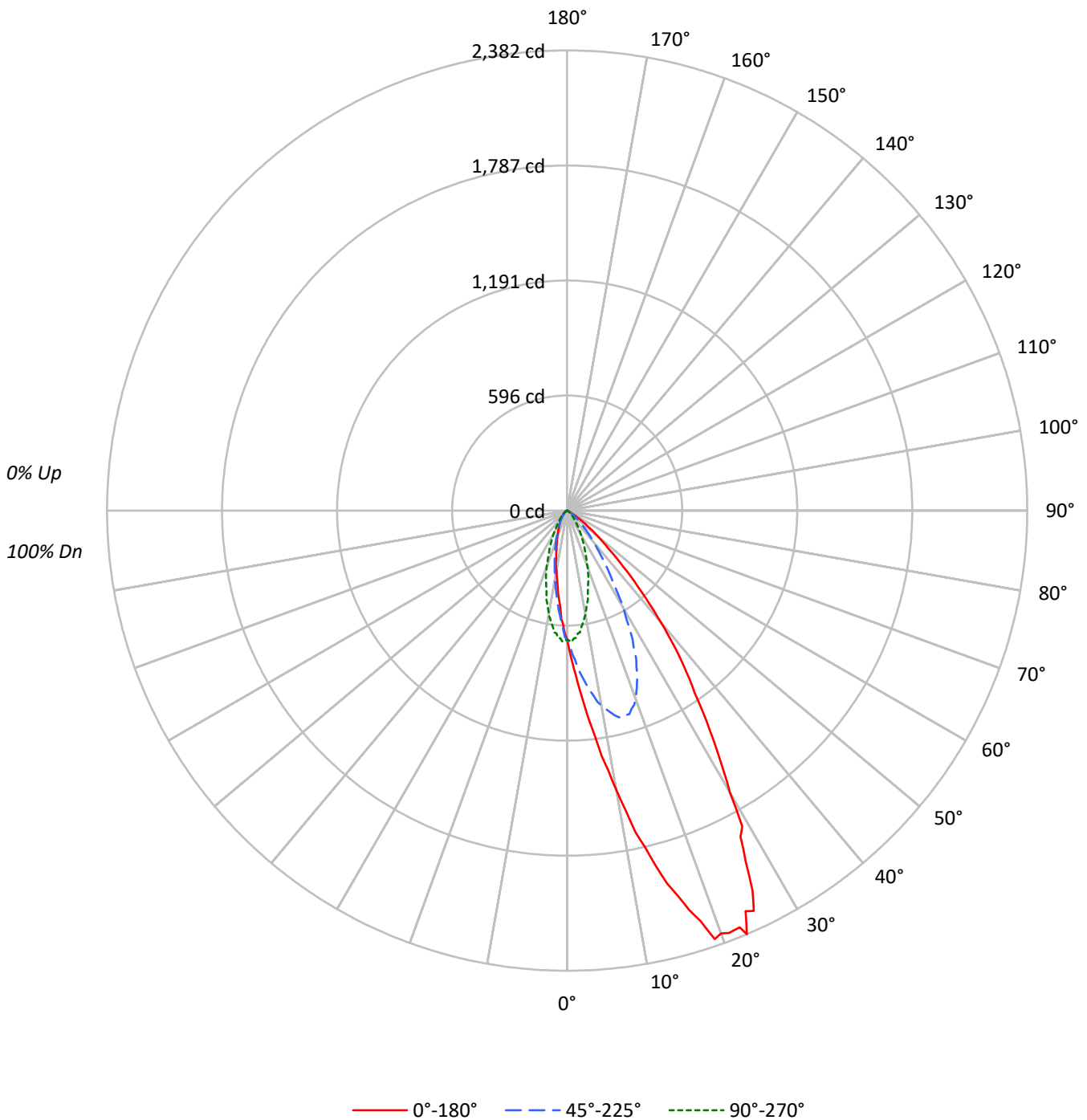
Input Watts (W): 11.3
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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	113	110	108	105	111	108	106	104	104	102	100	100	99	97	97	96	95	93					93			
2	107	102	98	94	105	100	96	93	97	94	91	94	91	89	91	89	87	85					85			
3	101	94	89	85	99	93	88	84	90	86	83	88	84	81	86	83	80	79					79			
4	96	88	82	77	94	86	81	77	84	80	76	82	78	75	80	77	74	72					72			
5	90	81	75	71	89	80	75	70	79	74	70	77	73	69	75	72	68	67					67			
6	85	76	70	65	84	75	69	65	74	68	64	72	67	64	71	67	63	62					62			
7	81	71	65	60	79	70	64	60	69	64	60	68	63	59	67	62	59	57					57			
8	77	66	60	56	75	66	60	56	65	59	55	64	59	55	63	58	55	53					53			
9	73	62	56	52	71	62	56	52	61	55	52	60	55	51	59	55	51	50					50			
10	69	59	53	49	68	58	52	48	57	52	48	57	52	48	56	51	48	47					47			

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	328788	328788	328788
5°	499573	315979	232626
10°	737258	274042	158363
15°	1021160	213201	109768
20°	1222826	161818	79387
25°	1244952	116389	56344
30°	960182	81012	43412
35°	693856	53424	38367
40°	485622	36647	30786
45°	287261	24630	19816
50°	158885	16579	15735
55°	76298	10752	13677
60°	28024	6710	11249
65°	5253	3969	7939
70°	1587	1587	3318
75°	0	2097	2097
80°	0	3125	3125
85°	0	6227	6227



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	66.2	8.1
10°-20°	202.9	24.8
20°-30°	261.5	32.0
30°-40°	175.3	21.4
40°-50°	79.8	9.8
50°-60°	25.5	3.1
60°-70°	4.6	0.6
70°-80°	1.0	0.1
80°-90°	0.8	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°	530.6	64.9
0°-40°	705.9	86.4
0°-60°	811.1	99.2
0°-90°	817.4	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	817.4	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	666	666	666	666	666	
5°	1009	859	638	512	470	111
15°	1999	1109	417	249	215	572
25°	2287	844	214	114	104	991
35°	1152	359	89	52	64	733
45°	412	123	35	24	28	332
55°	89	31	12	10	16	88
65°	4	3	3	3	7	8
75°	0	1	1	1	1	0
85°	0	1	1	1	1	0
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°	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4	666.4
1°	726.7	710.8	722.1	714.2	713.0	722.1	698.2	691.4	714.2	694.8	693.7
2°	788.1	780.1	781.3	774.4	777.9	766.5	766.5	761.9	754.0	758.5	740.3
3°	852.9	849.5	850.6	829.0	837.0	829.0	821.1	806.3	819.9	804.0	772.2
4°	928.0	915.5	914.3	908.6	908.6	881.3	880.2	874.5	859.7	834.7	821.1
5°	1008.7	999.6	975.7	981.4	962.1	960.9	942.8	910.9	915.5	884.8	858.6
6°	1091.7	1090.6	1075.8	1058.7	1049.6	1025.8	1021.2	968.9	975.7	931.4	895.0
7°	1173.6	1173.6	1163.4	1144.0	1120.2	1111.1	1091.7	1037.1	1021.2	973.5	931.4
8°	1279.4	1262.3	1227.1	1224.8	1195.2	1175.9	1154.3	1092.9	1073.5	1015.5	963.2
9°	1362.4	1359.0	1322.6	1313.5	1283.9	1244.1	1219.1	1149.7	1128.1	1050.8	1001.9
10°	1471.6	1462.5	1444.3	1403.3	1371.5	1343.0	1307.8	1240.7	1182.7	1100.8	1024.6
11°	1575.0	1565.9	1526.1	1504.5	1431.8	1393.1	1355.6	1289.6	1218.0	1134.9	1047.4
12°	1701.3	1638.7	1633.0	1593.2	1533.0	1503.4	1443.1	1363.5	1269.1	1156.5	1065.6
13°	1786.6	1763.8	1737.7	1666.0	1616.0	1547.7	1481.8	1388.5	1305.5	1195.2	1086.0
14°	1894.6	1894.6	1833.2	1774.1	1669.4	1639.9	1579.6	1457.9	1341.9	1218.0	1102.0
15°	1999.2	1958.3	1912.8	1842.3	1738.8	1694.4	1609.2	1497.7	1386.3	1235.0	1108.8
16°	2073.1	2072.0	2025.4	1927.6	1809.3	1749.0	1678.5	1536.4	1407.9	1241.8	1100.8
17°	2160.7	2180.0	2094.7	1993.5	1853.7	1799.1	1694.4	1539.8	1422.7	1245.2	1102.0
18°	2234.6	2224.4	2159.6	2043.6	1949.2	1811.6	1746.8	1567.1	1427.2	1230.5	1079.2
19°	2346.1	2297.2	2178.9	2085.7	1924.2	1877.5	1761.5	1579.6	1412.4	1225.9	1064.4
20°	2329.0	2330.2	2219.8	2097.0	1964.0	1836.6	1753.6	1575.0	1396.5	1207.7	1038.3
21°	2341.5	2343.8	2226.7	2098.2	1956.0	1845.7	1725.2	1530.7	1368.1	1196.3	1001.9
22.5°	2334.7	2283.5	2209.6	2074.3	1890.0	1825.2	1669.4	1502.3	1313.5	1124.7	947.3
23°	2382.5	2298.3	2153.9	2031.1	1868.4	1786.6	1675.1	1480.7	1327.1	1114.5	926.8
24°	2269.9	2239.2	2120.9	2003.8	1812.7	1710.4	1626.2	1430.6	1281.6	1046.2	882.5
25°	2286.9	2153.9	2060.6	1910.5	1763.8	1645.5	1537.5	1354.4	1223.6	1005.3	843.8
26°	2189.1	2108.4	1982.2	1850.2	1670.6	1565.9	1487.5	1296.4	1124.7	949.6	784.7
27°	2035.6	2032.2	1908.2	1733.1	1593.2	1506.8	1406.7	1229.3	1088.3	890.4	747.1
28°	1911.7	1873.0	1767.2	1646.7	1481.8	1377.2	1318.0	1154.3	995.1	826.8	680.1
29°	1869.6	1768.4	1668.3	1529.6	1410.1	1338.5	1233.9	1065.6	915.5	760.8	624.3
30°	1685.4	1641.0	1548.9	1446.5	1287.3	1211.1	1133.8	976.9	852.9	710.8	583.4
32.5°	1409.0	1372.6	1287.3	1200.9	1078.1	1000.7	928.0	799.5	675.5	549.3	446.9
35°	1152.0	1148.6	1056.5	971.2	870.0	801.7	739.2	628.9	536.8	427.6	359.4
37.5°	959.8	920.0	848.4	787.0	693.7	642.5	583.4	483.3	415.1	338.9	274.1
40°	754.0	726.7	675.5	605.0	534.5	486.7	448.1	369.6	318.4	259.3	212.7
42.5°	567.5	548.1	504.9	460.6	403.7	375.3	340.0	282.0	242.2	200.1	168.3
45°	411.7	398.0	369.6	334.3	290.0	267.2	246.8	211.5	176.3	150.1	122.8
47.5°	286.6	286.6	260.4	236.5	211.5	191.1	182.0	153.5	131.9	109.2	94.4
50°	207.0	201.3	186.5	169.4	150.1	139.9	127.4	110.3	94.4	80.7	68.2
52.5°	139.9	138.7	127.4	118.3	105.8	98.9	88.7	76.2	66.0	55.7	46.6
55°	88.7	86.4	80.7	72.8	67.1	62.5	58.0	48.9	43.2	36.4	30.7
57.5°	52.3	50.0	46.6	44.4	39.8	37.5	34.1	29.6	26.2	22.7	20.5
60°	28.4	27.3	26.2	23.9	23.9	21.6	19.3	18.2	15.9	13.6	11.4
62.5°	12.5	12.5	11.4	10.2	10.2	10.2	9.1	9.1	8.0	8.0	6.8
65°	4.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4



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CANDELA DISTRIBUTION (continued):

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
70°	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
72.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
75°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
80°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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°	666.4	666.4	666.4	666.4	666.4	666.4
1°	691.4	673.2	655.0	656.2	642.5	636.8
2°	699.4	680.1	635.7	609.5	599.3	592.5
3°	723.3	661.9	616.4	581.1	552.7	561.8
4°	739.2	660.7	591.4	540.2	500.4	503.8
5°	739.2	638.0	555.0	511.7	473.1	469.7
6°	755.1	634.6	531.1	478.8	437.8	440.1
7°	758.5	607.3	510.6	445.8	404.8	402.6
8°	755.1	586.8	476.5	416.2	382.1	369.6
9°	742.6	565.2	446.9	388.9	350.3	341.2
10°	733.5	547.0	424.2	361.6	324.1	316.1
11°	723.3	517.4	395.8	330.9	299.1	298.0
12°	709.6	493.6	370.7	311.6	274.1	283.2
13°	692.6	476.5	346.9	287.7	259.3	251.3
14°	671.0	441.2	326.4	268.4	233.1	232.0
15°	658.4	417.4	308.2	249.0	220.6	214.9
16°	627.7	394.6	283.2	228.6	199.0	201.3
17°	610.7	375.3	263.8	211.5	187.6	185.4
18°	574.3	353.7	235.4	196.7	174.0	171.7
19°	543.6	333.2	227.4	182.0	163.8	162.6
20°	515.2	308.2	211.5	170.6	151.2	151.2
21°	487.9	284.3	196.7	158.1	142.2	138.7
22.5°	445.8	255.9	177.4	142.2	126.2	125.1
23°	432.1	244.5	168.3	134.2	121.7	121.7
24°	402.6	228.6	154.7	124.0	113.7	111.4
25°	382.1	213.8	142.2	113.7	103.5	103.5
26°	349.1	195.6	129.6	104.6	96.7	97.8
27°	325.2	180.8	119.4	96.7	88.7	91.0
28°	304.8	166.0	110.3	88.7	84.2	85.3
29°	285.4	152.4	98.9	83.0	79.6	80.7
30°	258.1	142.2	91.0	76.2	75.1	76.2
32.5°	205.8	110.3	73.9	62.5	66.0	68.2
35°	158.1	88.7	59.1	52.3	58.0	63.7
37.5°	122.8	70.5	47.8	43.2	50.0	56.9
40°	97.8	56.9	38.7	35.3	40.9	47.8
42.5°	77.3	45.5	33.0	28.4	31.8	36.4
45°	61.4	35.3	26.2	23.9	26.2	28.4
47.5°	45.5	28.4	21.6	19.3	21.6	23.9
50°	34.1	21.6	17.1	15.9	18.2	20.5
52.5°	26.2	15.9	13.6	12.5	15.9	18.2
55°	18.2	12.5	10.2	10.2	13.6	15.9
57.5°	12.5	9.1	9.1	8.0	10.2	13.6
60°	9.1	6.8	6.8	6.8	9.1	11.4
62.5°	5.7	4.5	4.5	4.5	6.8	8.0
65°	3.4	3.4	3.4	3.4	4.5	6.8



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CANDELA DISTRIBUTION (continued):

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	1.1	1.1	2.3	2.3	3.4	4.5
70°	1.1	1.1	1.1	1.1	2.3	2.3
72.5°	1.1	1.1	1.1	1.1	1.1	1.1
75°	1.1	1.1	1.1	1.1	1.1	1.1
77.5°	1.1	1.1	1.1	1.1	1.1	1.1
80°	1.1	1.1	1.1	1.1	1.1	1.1
82.5°	1.1	1.1	1.1	1.1	1.1	1.1
85°	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
90°	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)