

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: P275380

Luminaire Tested: **ML4D09\_927 - TIR50AWW25 - TL41RMW - TL42SMW**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P275380  
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\_927 - TIR50AWW25 - TL41RMW - TL42SMW  
Description: ML4 900LM 2700K, 90CRI, 25° ASYMM WW, WITH ROUND PINHOLE MATTE WHITE FLANGE  
Light Source: (1) HIGH LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 718.5 lumens  
Efficiency: N/A  
Efficacy: 63.6 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

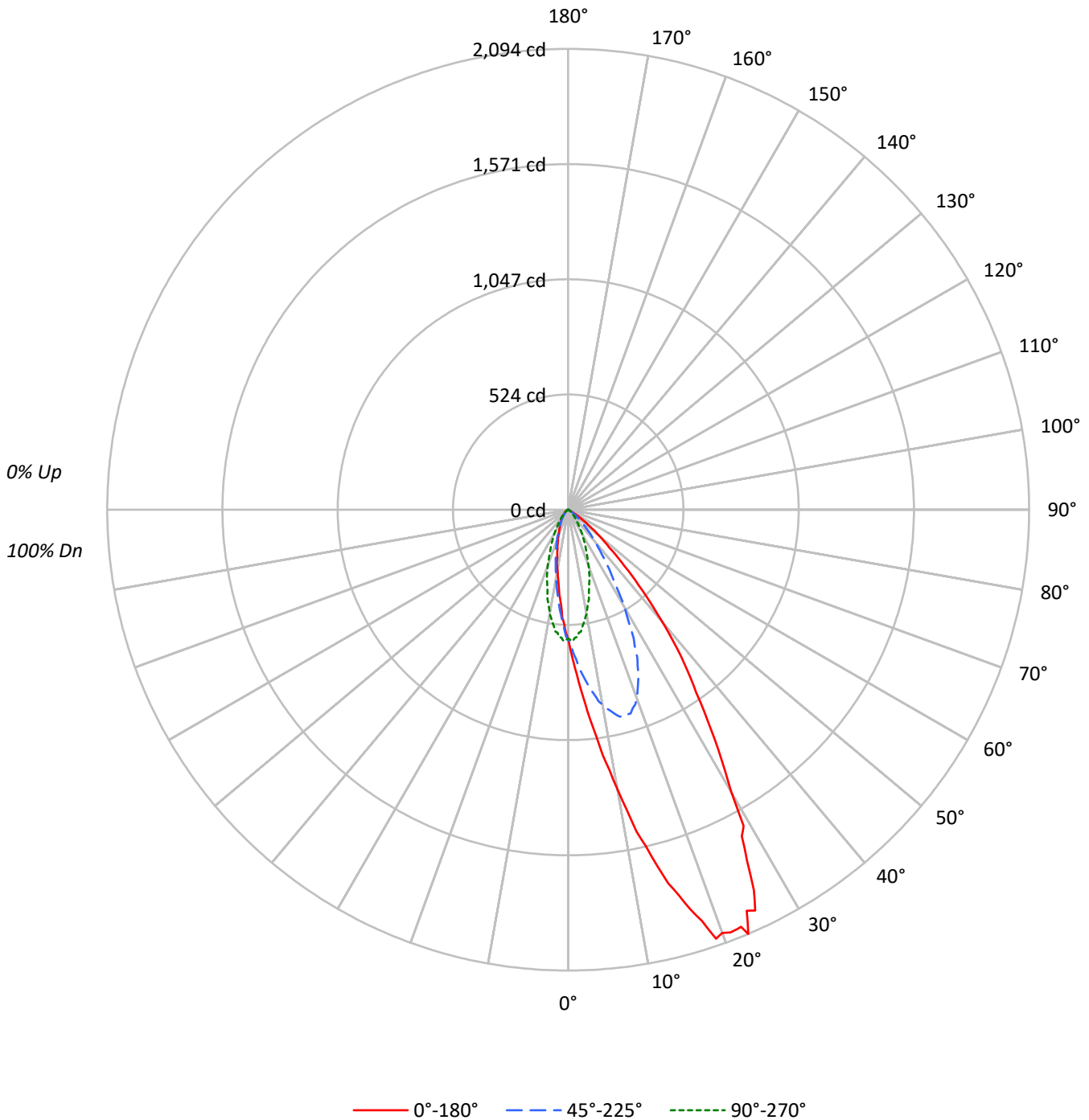
Input Watts (W): 11.3  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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

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

	0°	90°	180°
0°	288972	288972	288972
5°	439052	277695	204445
10°	647931	240826	139225
15°	897499	187356	96487
20°	1074712	142234	69778
25°	1094158	102290	49539
30°	843848	71156	38170
35°	609834	46980	33729
40°	426755	32203	27051
45°	252444	21630	17444
50°	139620	14584	13816
55°	67094	9462	12043
60°	24669	5921	9868
65°	4670	3502	7005
70°	1443	1443	2885
75°	0	1906	1906
80°	0	2841	2841
85°	0	5661	5661



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	58.2	8.1
10°-20°	178.3	24.8
20°-30°	229.8	32.0
30°-40°	154.1	21.4
40°-50°	70.1	9.8
50°-60°	22.4	3.1
60°-70°	4.0	0.6
70°-80°	0.9	0.1
80°-90°	0.7	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°	466.3	64.9
0°-40°	620.4	86.3
0°-60°	712.9	99.2
0°-90°	718.5	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	718.5	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	586	586	586	586	586	
5°	886	755	561	450	413	97
15°	1757	974	367	219	189	502
25°	2010	742	188	100	91	871
35°	1012	316	78	46	56	644
45°	362	108	31	21	25	292
55°	78	27	11	9	14	77
65°	4	3	3	3	6	7
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°	585.7	585.7	585.7	585.7	585.7	585.7	585.7	585.7	585.7	585.7	585.7
1°	638.7	624.7	634.7	627.7	626.7	634.7	613.7	607.7	627.7	610.7	609.7
2°	692.6	685.6	686.6	680.6	683.6	673.6	673.6	669.6	662.6	666.6	650.7
3°	749.6	746.6	747.6	728.6	735.6	728.6	721.6	708.6	720.6	706.6	678.6
4°	815.6	804.6	803.6	798.6	798.6	774.6	773.6	768.6	755.6	733.6	721.6
5°	886.5	878.5	857.5	862.5	845.5	844.5	828.6	800.6	804.6	777.6	754.6
6°	959.5	958.5	945.5	930.5	922.5	901.5	897.5	851.5	857.5	818.6	786.6
7°	1031.4	1031.4	1022.5	1005.5	984.5	976.5	959.5	911.5	897.5	855.5	818.6
8°	1124.4	1109.4	1078.4	1076.4	1050.4	1033.4	1014.5	960.5	943.5	892.5	846.5
9°	1197.4	1194.4	1162.4	1154.4	1128.4	1093.4	1071.4	1010.5	991.5	923.5	880.5
10°	1293.3	1285.3	1269.3	1233.3	1205.4	1180.4	1149.4	1090.4	1039.4	967.5	900.5
11°	1384.3	1376.3	1341.3	1322.3	1258.3	1224.3	1191.4	1133.4	1070.4	997.5	920.5
12°	1495.2	1440.2	1435.2	1400.2	1347.3	1321.3	1268.3	1198.4	1115.4	1016.5	936.5
13°	1570.2	1550.2	1527.2	1464.2	1420.2	1360.3	1302.3	1220.3	1147.4	1050.4	954.5
14°	1665.1	1665.1	1611.1	1559.2	1467.2	1441.2	1388.3	1281.3	1179.4	1070.4	968.5
15°	1757.1	1721.1	1681.1	1619.1	1528.2	1489.2	1414.2	1316.3	1218.3	1085.4	974.5
16°	1822.0	1821.0	1780.0	1694.1	1590.1	1537.2	1475.2	1350.3	1237.3	1091.4	967.5
17°	1899.0	1916.0	1841.0	1752.1	1629.1	1581.2	1489.2	1353.3	1250.3	1094.4	968.5
18°	1963.9	1955.0	1898.0	1796.0	1713.1	1592.1	1535.2	1377.3	1254.3	1081.4	948.5
19°	2061.9	2018.9	1915.0	1833.0	1691.1	1650.1	1548.2	1388.3	1241.3	1077.4	935.5
20°	2046.9	2047.9	1951.0	1843.0	1726.1	1614.1	1541.2	1384.3	1227.3	1061.4	912.5
21°	2057.9	2059.9	1957.0	1844.0	1719.1	1622.1	1516.2	1345.3	1202.4	1051.4	880.5
22.5°	2051.9	2006.9	1942.0	1823.0	1661.1	1604.1	1467.2	1320.3	1154.4	988.5	832.6
23°	2093.9	2019.9	1893.0	1785.0	1642.1	1570.2	1472.2	1301.3	1166.4	979.5	814.6
24°	1994.9	1967.9	1864.0	1761.1	1593.1	1503.2	1429.2	1257.3	1126.4	919.5	775.6
25°	2009.9	1893.0	1811.0	1679.1	1550.2	1446.2	1351.3	1190.4	1075.4	883.5	741.6
26°	1924.0	1853.0	1742.1	1626.1	1468.2	1376.3	1307.3	1139.4	988.5	834.6	689.6
27°	1789.0	1786.0	1677.1	1523.2	1400.2	1324.3	1236.3	1080.4	956.5	782.6	656.6
28°	1680.1	1646.1	1553.2	1447.2	1302.3	1210.4	1158.4	1014.5	874.5	726.6	597.7
29°	1643.1	1554.2	1466.2	1344.3	1239.3	1176.4	1084.4	936.5	804.6	668.6	548.7
30°	1481.2	1442.2	1361.3	1271.3	1131.4	1064.4	996.5	858.5	749.6	624.7	512.7
32.5°	1238.3	1206.4	1131.4	1055.4	947.5	879.5	815.6	702.6	593.7	482.7	392.8
35°	1012.5	1009.5	928.5	853.5	764.6	704.6	649.7	552.7	471.7	375.8	315.8
37.5°	843.5	808.6	745.6	691.6	609.7	564.7	512.7	424.8	364.8	297.8	240.9
40°	662.6	638.7	593.7	531.7	469.7	427.8	393.8	324.8	279.9	227.9	186.9
42.5°	498.7	481.7	443.8	404.8	354.8	329.8	298.8	247.9	212.9	175.9	147.9
45°	361.8	349.8	324.8	293.8	254.9	234.9	216.9	185.9	154.9	131.9	107.9
47.5°	251.9	251.9	228.9	207.9	185.9	167.9	159.9	134.9	115.9	95.9	83.0
50°	181.9	176.9	163.9	148.9	131.9	122.9	111.9	96.9	83.0	71.0	60.0
52.5°	122.9	121.9	111.9	103.9	93.0	87.0	78.0	67.0	58.0	49.0	41.0
55°	78.0	76.0	71.0	64.0	59.0	55.0	51.0	43.0	38.0	32.0	27.0
57.5°	46.0	44.0	41.0	39.0	35.0	33.0	30.0	26.0	23.0	20.0	18.0
60°	25.0	24.0	23.0	21.0	21.0	19.0	17.0	16.0	14.0	12.0	10.0
62.5°	11.0	11.0	10.0	9.0	9.0	9.0	8.0	8.0	7.0	7.0	6.0
65°	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0



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**CANDELA DISTRIBUTION (continued):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
67.5°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
70°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
72.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0
75°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0
77.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
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	1.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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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CATALOG NUMBER: ML4D09\_927 - TIR50AWW25 - TL41RMW - TL42SMW

**CANDELA DISTRIBUTION (continued):**

	67.5°	90°	112.5°	135°	157.5°	180°
0°	585.7	585.7	585.7	585.7	585.7	585.7
1°	607.7	591.7	575.7	576.7	564.7	559.7
2°	614.7	597.7	558.7	535.7	526.7	520.7
3°	635.7	581.7	541.7	510.7	485.7	493.7
4°	649.7	580.7	519.7	474.7	439.8	442.8
5°	649.7	560.7	487.7	449.8	415.8	412.8
6°	663.6	557.7	466.7	420.8	384.8	386.8
7°	666.6	533.7	448.8	391.8	355.8	353.8
8°	663.6	515.7	418.8	365.8	335.8	324.8
9°	652.7	496.7	392.8	341.8	307.8	299.8
10°	644.7	480.7	372.8	317.8	284.8	277.9
11°	635.7	454.8	347.8	290.8	262.9	261.9
12°	623.7	433.8	325.8	273.9	240.9	248.9
13°	608.7	418.8	304.8	252.9	227.9	220.9
14°	589.7	387.8	286.8	235.9	204.9	203.9
15°	578.7	366.8	270.9	218.9	193.9	188.9
16°	551.7	346.8	248.9	200.9	174.9	176.9
17°	536.7	329.8	231.9	185.9	164.9	162.9
18°	504.7	310.8	206.9	172.9	152.9	150.9
19°	477.7	292.8	199.9	159.9	143.9	142.9
20°	452.8	270.9	185.9	149.9	132.9	132.9
21°	428.8	249.9	172.9	138.9	124.9	121.9
22.5°	391.8	224.9	155.9	124.9	110.9	109.9
23°	379.8	214.9	147.9	117.9	106.9	106.9
24°	353.8	200.9	135.9	108.9	99.9	97.9
25°	335.8	187.9	124.9	99.9	91.0	91.0
26°	306.8	171.9	113.9	92.0	85.0	86.0
27°	285.8	158.9	104.9	85.0	78.0	80.0
28°	267.9	145.9	96.9	78.0	74.0	75.0
29°	250.9	133.9	87.0	73.0	70.0	71.0
30°	226.9	124.9	80.0	67.0	66.0	67.0
32.5°	180.9	96.9	65.0	55.0	58.0	60.0
35°	138.9	78.0	52.0	46.0	51.0	56.0
37.5°	107.9	62.0	42.0	38.0	44.0	50.0
40°	86.0	50.0	34.0	31.0	36.0	42.0
42.5°	68.0	40.0	29.0	25.0	28.0	32.0
45°	54.0	31.0	23.0	21.0	23.0	25.0
47.5°	40.0	25.0	19.0	17.0	19.0	21.0
50°	30.0	19.0	15.0	14.0	16.0	18.0
52.5°	23.0	14.0	12.0	11.0	14.0	16.0
55°	16.0	11.0	9.0	9.0	12.0	14.0
57.5°	11.0	8.0	8.0	7.0	9.0	12.0
60°	8.0	6.0	6.0	6.0	8.0	10.0
62.5°	5.0	4.0	4.0	4.0	6.0	7.0
65°	3.0	3.0	3.0	3.0	4.0	6.0





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**CANDELA DISTRIBUTION (continued):**

	67.5°	90°	112.5°	135°	157.5°	180°
67.5°	1.0	1.0	2.0	2.0	3.0	4.0
70°	1.0	1.0	1.0	1.0	2.0	2.0
72.5°	1.0	1.0	1.0	1.0	1.0	1.0
75°	1.0	1.0	1.0	1.0	1.0	1.0
77.5°	1.0	1.0	1.0	1.0	1.0	1.0
80°	1.0	1.0	1.0	1.0	1.0	1.0
82.5°	1.0	1.0	1.0	1.0	1.0	1.0
85°	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
90°	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)