

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P#

Luminaire Tested: **FLDSQ4C45D010 FEU4C459027 F4LC-DFSSQ-MW**

Issue Date: 12/13/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P#  
 Test Lab: INNOVATION CENTER  
 Issue Date: 12/13/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: FAIL-SAFE  
 Catalog Number: FLDSQ4C45D010 FEU4C459027 F4LC-DFSSQ-MW  
 Description: 4 INCH 4500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 2700K, 90CRI LEDS AND F4LC-DFSSQ TRIM WITH MW FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

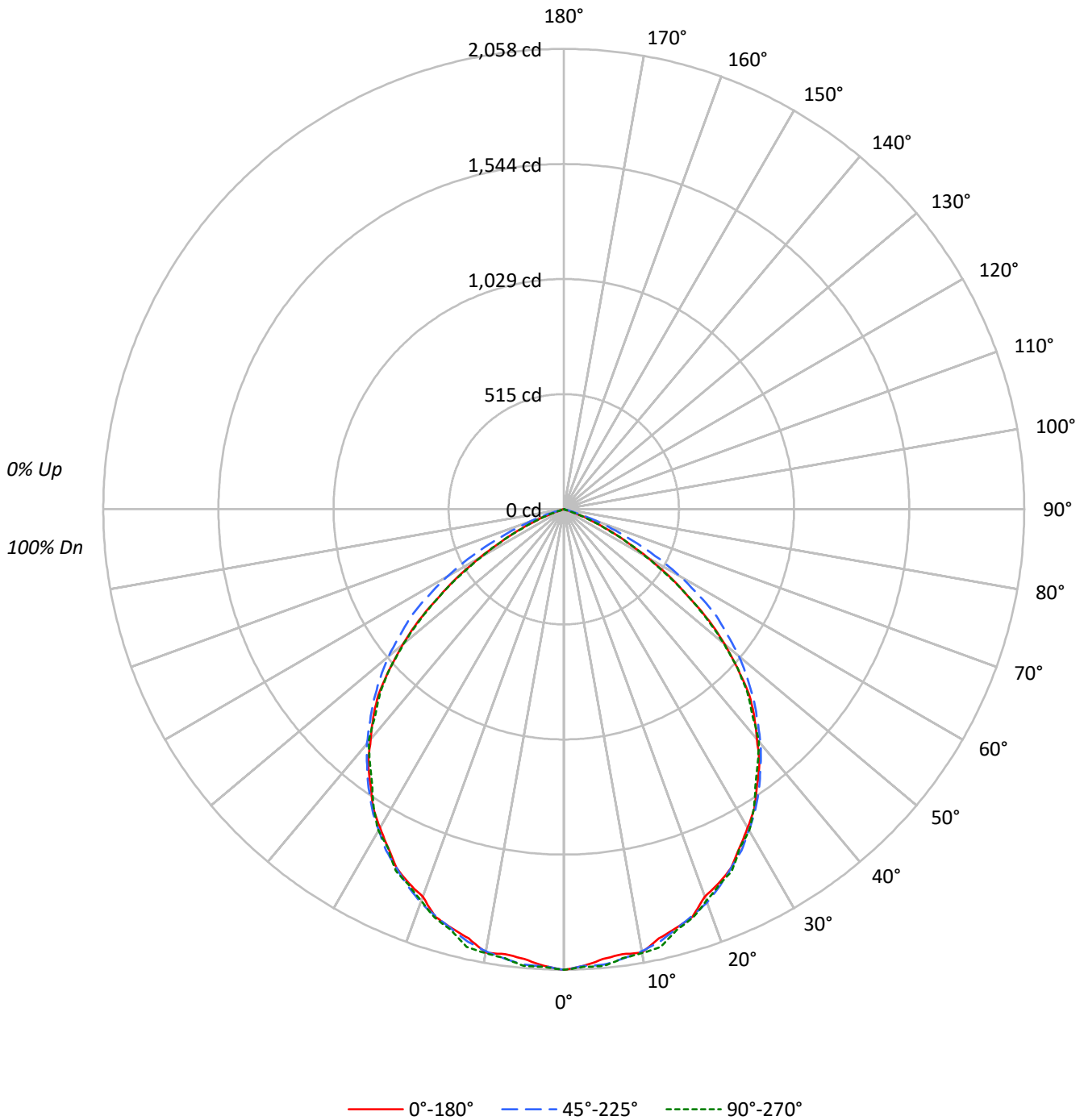
Lumens per Lamp: N/A  
 Luminaire Lumens: 4397.0 lumens  
 Efficiency: N/A  
 Efficacy: 88.6 lumens/watt  
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

Input Watts (W): 49.6  
 Input Voltage (V):  
 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

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	GONIO 1 IN0055	4/22/2021	10/22/2021
Power Meter	XITRON 2801 IN0197	12/1/2020	12/1/2021
AC Power Source	CHROMA 61505 IN0196	12/1/2020	12/1/2021
DC Power Supply	AGILENT E3634A IN0198	11/30/2020	11/30/2021
Room Thermometer	ONSET IN0143	12/1/2020	12/1/2021

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### Luminous Intensity Polar Plot



TEST NUMBER: P#

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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	0
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111		106	106	106		102	102	102	100
1	111	108	104	101	109	105	102	100	101	99	96		97	95	94		94	92	91	89
2	103	96	91	86	100	94	89	85	91	87	83		88	84	81		85	82	79	77
3	95	86	79	74	93	85	78	73	82	76	72		79	74	71		77	73	69	67
4	88	77	70	64	86	76	69	63	74	67	63		71	66	62		69	65	61	59
5	81	70	62	56	79	69	61	56	67	60	55		65	59	54		63	58	54	52
6	75	63	55	49	73	62	55	49	61	54	49		59	53	48		57	52	48	46
7	70	58	50	44	68	57	49	44	55	49	44		54	48	43		53	47	43	41
8	65	53	45	40	64	52	45	39	51	44	39		50	44	39		49	43	39	37
9	61	49	41	36	60	48	41	36	47	40	36		46	40	35		45	39	35	33
10	57	45	38	33	56	44	37	33	44	37	32		43	37	32		42	36	32	31

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

	0°	45°	90°
0°	198613	198613	198613
5°	195410	197948	198509
10°	197091	196523	197375
15°	193642	193922	194511
20°	189139	192137	191244
25°	188324	188324	189559
30°	183067	184371	184705
35°	177358	179090	175980
40°	169035	172347	170874
45°	159981	163583	158384
50°	140893	153172	140008
55°	114106	140180	114611
60°	83501	116231	81823
65°	50731	82763	49407
70°	19776	44546	18986
75°	2162	12004	2162
80°	1667	1667	1667
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	194.3	4.4
10°-20°	549.8	12.5
20°-30°	815.8	18.6
30°-40°	945.2	21.5
40°-50°	906.3	20.6
50°-60°	666.3	15.2
60°-70°	287.8	6.5
70°-80°	31.1	0.7
80°-90°	0.4	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°	1559.9	35.5
0°-40°	2505.1	57.0
0°-60°	4077.7	92.7
0°-90°	4397.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4397.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	2058	2058	2058	2058	2058	
5°	2018	2038	2044	2047	2050	192
15°	1938	1950	1941	1944	1947	546
25°	1769	1766	1769	1772	1780	810
35°	1506	1514	1520	1517	1494	942
45°	1172	1175	1199	1181	1161	891
55°	678	748	833	746	681	610
65°	222	278	362	275	216	228
75°	6	9	32	6	6	18
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

TEST NUMBER: P#  
 CATALOG NUMBER: FLDSQ4C45D010 FEU4C459027 F4LC-DFSSQ-MW

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4
2.5°	2043.7	2067.1	2070.1	2055.4	2049.5	2040.8	2061.2	2046.7	2052.5	2046.7	2043.7
5°	2017.5	2043.7	2046.7	2046.7	2040.8	2037.9	2046.7	2043.7	2040.8	2035.0	2043.7
7.5°	2005.8	2020.3	2035.0	2017.5	2026.2	2023.3	2043.7	2035.0	2032.0	2032.0	2026.2
10°	2011.6	2008.6	2020.3	2002.8	2008.6	2002.8	2020.3	2020.3	2014.5	2008.6	2005.8
12.5°	1964.7	1988.1	1988.1	1985.2	1979.4	1970.6	1988.1	1999.9	1982.3	1982.3	1979.4
15°	1938.5	1944.3	1947.2	1947.2	1944.3	1950.2	1958.9	1947.2	1950.2	1935.5	1941.3
17.5°	1909.3	1897.6	1906.3	1900.4	1903.4	1909.3	1920.9	1920.9	1903.4	1900.4	1906.3
20°	1842.0	1877.1	1880.0	1862.5	1865.4	1865.4	1885.9	1868.3	1880.0	1865.4	1871.2
22.5°	1809.8	1833.2	1836.1	1812.8	1827.3	1809.8	1830.3	1803.9	1833.2	1812.8	1821.5
25°	1768.9	1766.0	1774.7	1763.0	1766.0	1766.0	1780.5	1768.9	1777.7	1766.0	1768.9
27.5°	1701.7	1725.1	1722.1	1710.4	1716.2	1713.4	1742.6	1710.4	1727.9	1713.4	1719.2
30°	1643.1	1663.6	1657.8	1646.1	1646.1	1637.3	1669.5	1660.7	1657.8	1657.8	1654.8
32.5°	1584.7	1587.6	1581.8	1584.7	1587.6	1576.0	1602.2	1590.5	1587.6	1590.5	1593.5
35°	1505.7	1505.7	1511.5	1502.8	1514.5	1514.5	1537.9	1523.2	1520.4	1511.5	1520.4
37.5°	1435.6	1426.8	1429.7	1429.7	1435.6	1441.4	1453.1	1447.2	1447.2	1438.5	1444.4
40°	1342.0	1336.2	1344.9	1344.9	1353.7	1353.7	1365.4	1359.6	1368.3	1368.3	1368.3
42.5°	1260.2	1260.2	1254.3	1263.1	1266.0	1263.1	1283.6	1280.6	1283.6	1277.7	1280.6
45°	1172.4	1172.4	1166.6	1163.7	1178.2	1175.4	1198.8	1189.9	1201.6	1195.8	1198.8
47.5°	1052.5	1067.2	1058.4	1067.2	1084.7	1087.7	1102.3	1096.4	1108.1	1099.4	1111.1
50°	938.6	938.6	947.3	959.0	976.5	979.5	997.0	1008.7	1014.6	1017.4	1020.4
52.5°	818.7	815.7	824.5	839.1	853.8	865.5	883.0	900.5	912.2	929.8	920.9
55°	678.3	684.1	693.0	710.5	733.9	748.4	763.1	786.5	807.0	815.7	833.3
57.5°	558.4	552.6	558.4	581.8	608.1	619.8	640.4	663.7	693.0	710.5	716.3
60°	432.7	435.7	441.5	462.0	482.4	500.0	508.8	546.7	573.1	590.6	602.3
62.5°	318.7	324.6	330.4	348.0	368.4	383.0	397.6	429.8	453.2	470.7	482.4
65°	222.2	225.1	233.9	242.6	263.2	277.7	289.4	315.8	339.1	353.8	362.5
67.5°	137.4	140.3	146.1	157.9	172.5	184.2	195.9	213.4	233.9	248.5	251.5
70°	70.1	73.1	76.0	84.8	96.5	102.4	111.1	125.7	140.3	152.0	157.9
72.5°	23.4	23.4	26.4	32.2	38.1	43.9	46.8	61.4	73.1	79.0	81.8
75°	5.8	5.8	5.8	5.8	5.8	8.8	8.8	17.5	23.4	29.2	32.2
77.5°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.8	5.8
80°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
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	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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



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**CANDELA DISTRIBUTION (continued):**

	50°	55°	60°	65°	67.5°	70°	75°	80°	85°	90°
0°	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4	2058.4
2.5°	2058.4	2052.5	2049.5	2052.5	2052.5	2049.5	2058.4	2070.1	2084.6	2046.7
5°	2055.4	2049.5	2055.4	2037.9	2046.7	2040.8	2052.5	2049.5	2061.2	2049.5
7.5°	2046.7	2035.0	2037.9	2029.1	2040.8	2026.2	2035.0	2052.5	2040.8	2023.3
10°	2017.5	2011.6	2032.0	2002.8	1996.9	2008.6	2032.0	2014.5	2008.6	2014.5
12.5°	1988.1	1988.1	1996.9	1973.6	1976.4	1982.3	1994.0	1982.3	1988.1	2002.8
15°	1956.0	1950.2	1964.7	1947.2	1944.3	1938.5	1950.2	1950.2	1956.0	1947.2
17.5°	1918.0	1909.3	1909.3	1903.4	1900.4	1915.1	1920.9	1923.8	1926.8	1915.1
20°	1871.2	1868.3	1877.1	1868.3	1871.2	1874.2	1874.2	1868.3	1894.6	1862.5
22.5°	1821.5	1830.3	1818.6	1812.8	1818.6	1824.4	1824.4	1827.3	1821.5	1815.6
25°	1771.8	1777.7	1780.5	1763.0	1771.8	1763.0	1783.5	1786.4	1774.7	1780.5
27.5°	1727.9	1719.2	1716.2	1704.6	1710.4	1707.5	1710.4	1710.4	1727.9	1704.6
30°	1660.7	1651.9	1654.8	1646.1	1649.0	1646.1	1649.0	1649.0	1660.7	1657.8
32.5°	1596.4	1587.6	1590.5	1581.8	1581.8	1584.7	1578.8	1578.8	1587.6	1581.8
35°	1534.9	1514.5	1517.4	1514.5	1517.4	1505.7	1505.7	1502.8	1508.7	1494.0
37.5°	1447.2	1438.5	1435.6	1432.7	1435.6	1429.7	1435.6	1426.8	1435.6	1423.9
40°	1368.3	1362.4	1365.4	1347.9	1347.9	1350.7	1344.9	1342.0	1344.9	1356.6
42.5°	1289.4	1277.7	1271.9	1266.0	1268.9	1260.2	1257.2	1251.4	1257.2	1245.5
45°	1195.8	1195.8	1192.9	1178.2	1181.2	1181.2	1169.5	1157.8	1160.7	1160.7
47.5°	1111.1	1105.2	1102.3	1087.7	1084.7	1081.9	1070.0	1061.3	1061.3	1052.5
50°	1017.4	1011.6	1002.9	988.2	982.4	964.8	956.1	944.4	932.7	932.7
52.5°	929.8	909.2	897.6	874.2	865.5	856.6	833.3	824.5	815.7	807.0
55°	824.5	807.0	783.6	757.3	745.6	730.9	707.5	690.0	678.3	681.3
57.5°	722.2	693.0	669.6	634.5	619.8	611.0	587.6	564.2	552.6	552.6
60°	596.5	573.1	543.8	511.6	500.0	485.4	456.1	441.5	432.7	424.0
62.5°	476.6	459.0	432.7	391.8	383.0	368.4	348.0	330.4	321.6	321.6
65°	356.7	339.1	315.8	286.5	274.8	263.2	245.6	228.1	219.3	216.4
67.5°	251.5	230.9	210.5	187.2	178.3	172.5	155.0	143.3	137.4	134.4
70°	152.0	140.3	125.7	108.2	99.4	93.5	81.8	73.1	70.1	67.3
72.5°	79.0	70.1	58.5	46.8	40.9	35.1	29.2	23.4	20.5	20.5
75°	29.2	23.4	14.7	8.8	5.8	5.8	5.8	5.8	5.8	5.8
77.5°	5.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
80°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
82.5°	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
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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

(END OF REPORT)