

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 FEU4C459035 F4LC-CSSQ-MMS**

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 FEU4C459035 F4LC-CSSQ-MMS  
 Description: 4 INCH 4500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 3500K, 90CRI LEDS AND F4LC-CSSQ TRIM WITH MMS FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

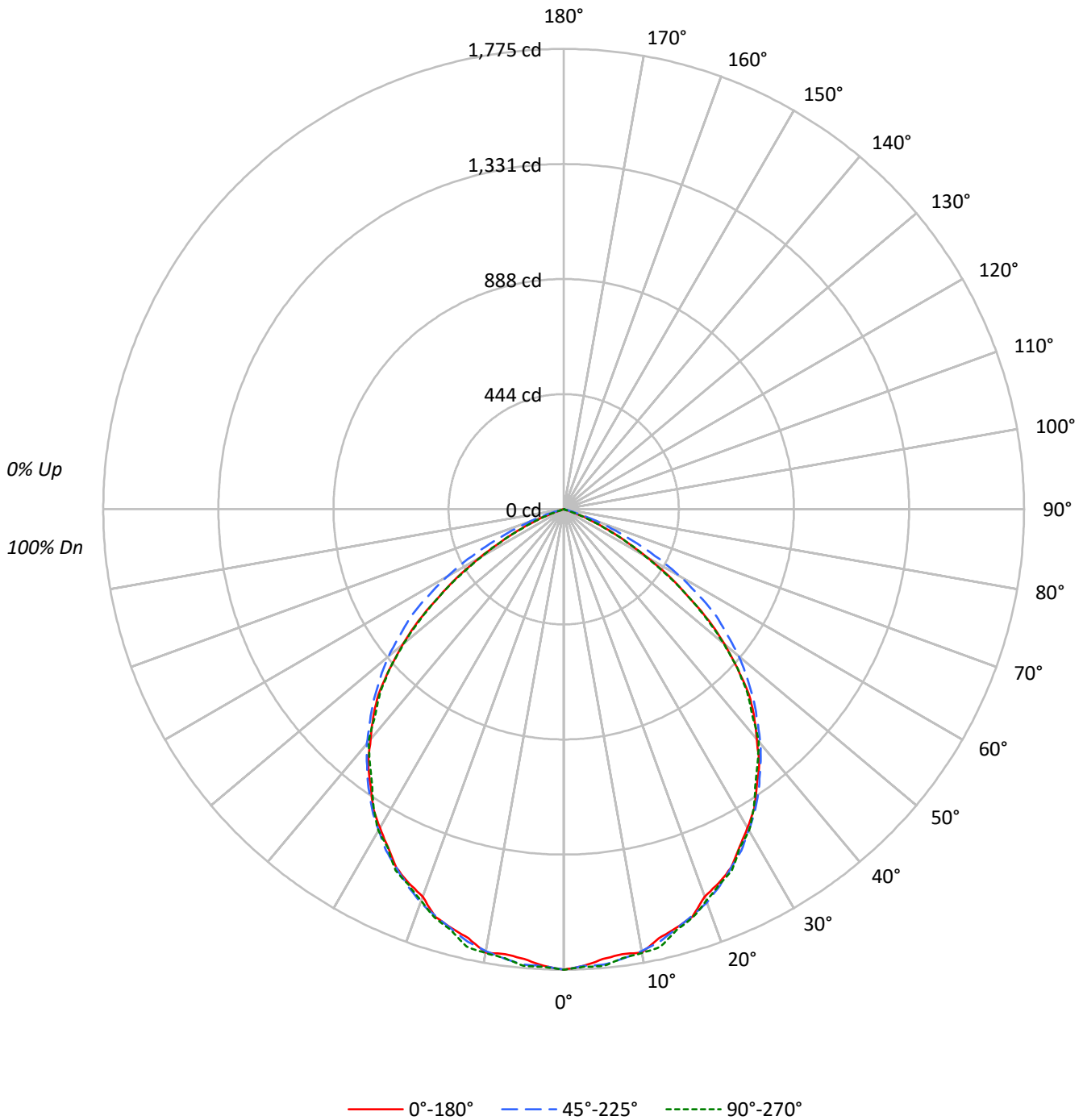
Lumens per Lamp: N/A  
 Luminaire Lumens: 3792.0 lumens  
 Efficiency: N/A  
 Efficacy: 76.5 lumens/watt  
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

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

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

	0°	45°	90°
0°	171287	171287	171287
5°	168522	170711	171196
10°	169971	169481	170216
15°	167001	167240	167750
20°	163109	165697	164927
25°	162410	162410	163486
30°	157876	159001	159291
35°	152952	154448	151762
40°	145783	148630	147357
45°	137971	141068	136592
50°	121499	132097	120749
55°	98411	120885	98831
60°	72000	100233	70553
65°	43767	71370	42603
70°	17068	38424	16363
75°	1864	10364	1864
80°	1445	1445	1445
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	167.6	4.4
10°-20°	474.1	12.5
20°-30°	703.5	18.6
30°-40°	815.2	21.5
40°-50°	781.6	20.6
50°-60°	574.7	15.2
60°-70°	248.2	6.5
70°-80°	26.8	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°	1345.2	35.5
0°-40°	2160.4	57.0
0°-60°	3516.6	92.7
0°-90°	3792.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	3792.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	1775	1775	1775	1775	1775	
5°	1740	1758	1762	1765	1768	166
15°	1672	1682	1674	1677	1679	471
25°	1526	1523	1526	1528	1536	698
35°	1298	1306	1311	1309	1288	812
45°	1011	1014	1034	1019	1001	769
55°	585	646	719	643	588	526
65°	192	240	313	237	187	197
75°	5	8	28	5	5	16
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

TEST NUMBER: P#  
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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	22.5°	25°	30°	35°	40°	45°
0°	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2
2.5°	1762.5	1782.7	1785.2	1772.6	1767.5	1760.0	1777.6	1765.1	1770.1	1765.1	1762.5
5°	1739.9	1762.5	1765.1	1765.1	1760.0	1757.5	1765.1	1762.5	1760.0	1755.0	1762.5
7.5°	1729.8	1742.3	1755.0	1739.9	1747.4	1744.9	1762.5	1755.0	1752.4	1752.4	1747.4
10°	1734.8	1732.3	1742.3	1727.2	1732.3	1727.2	1742.3	1742.3	1737.3	1732.3	1729.8
12.5°	1694.4	1714.6	1714.6	1712.1	1707.0	1699.4	1714.6	1724.7	1709.5	1709.5	1707.0
15°	1671.8	1676.8	1679.3	1679.3	1676.8	1681.8	1689.4	1679.3	1681.8	1669.2	1674.2
17.5°	1646.6	1636.5	1644.0	1638.9	1641.5	1646.6	1656.6	1656.6	1641.5	1638.9	1644.0
20°	1588.5	1618.8	1621.4	1606.2	1608.7	1608.7	1626.4	1611.3	1621.4	1608.7	1613.7
22.5°	1560.8	1580.9	1583.5	1563.3	1575.9	1560.8	1578.5	1555.7	1580.9	1563.3	1570.8
25°	1525.5	1523.0	1530.5	1520.4	1523.0	1523.0	1535.6	1525.5	1533.1	1523.0	1525.5
27.5°	1467.5	1487.7	1485.1	1475.1	1480.1	1477.6	1502.8	1475.1	1490.2	1477.6	1482.7
30°	1417.0	1434.7	1429.7	1419.6	1419.6	1412.0	1439.8	1432.2	1429.7	1429.7	1427.1
32.5°	1366.6	1369.2	1364.2	1366.6	1369.2	1359.1	1381.8	1371.7	1369.2	1371.7	1374.2
35°	1298.5	1298.5	1303.6	1296.1	1306.1	1306.1	1326.3	1313.6	1311.2	1303.6	1311.2
37.5°	1238.0	1230.5	1233.0	1233.0	1238.0	1243.1	1253.2	1248.1	1248.1	1240.6	1245.6
40°	1157.4	1152.3	1159.8	1159.8	1167.5	1167.5	1177.5	1172.5	1180.0	1180.0	1180.0
42.5°	1086.8	1086.8	1081.8	1089.3	1091.8	1089.3	1107.0	1104.4	1107.0	1101.9	1104.4
45°	1011.1	1011.1	1006.0	1003.6	1016.1	1013.7	1033.8	1026.2	1036.3	1031.2	1033.8
47.5°	907.7	920.3	912.7	920.3	935.5	938.0	950.6	945.5	955.6	948.1	958.2
50°	809.4	809.4	817.0	827.0	842.2	844.7	859.9	869.9	875.0	877.4	880.0
52.5°	706.0	703.5	711.1	723.6	736.3	746.4	761.5	776.6	786.7	801.8	794.2
55°	585.0	590.0	597.6	612.7	632.9	645.5	658.1	678.3	696.0	703.5	718.6
57.5°	481.6	476.5	481.6	501.7	524.5	534.6	552.2	572.4	597.6	612.7	617.8
60°	373.1	375.7	380.7	398.4	416.0	431.2	438.8	471.5	494.2	509.3	519.4
62.5°	274.9	279.9	285.0	300.1	317.7	330.3	342.9	370.7	390.8	406.0	416.0
65°	191.7	194.1	201.7	209.3	226.9	239.5	249.6	272.3	292.5	305.1	312.6
67.5°	118.5	121.0	126.0	136.2	148.8	158.8	168.9	184.0	201.7	214.3	216.9
70°	60.5	63.1	65.5	73.1	83.2	88.3	95.8	108.4	121.0	131.1	136.2
72.5°	20.2	20.2	22.7	27.8	32.8	37.9	40.3	53.0	63.1	68.1	70.6
75°	5.0	5.0	5.0	5.0	5.0	7.6	7.6	15.1	20.2	25.2	27.8
77.5°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	5.0	5.0
80°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
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°	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2	1775.2
2.5°	1775.2	1770.1	1767.5	1770.1	1770.1	1767.5	1775.2	1785.2	1797.8	1765.1
5°	1772.6	1767.5	1772.6	1757.5	1765.1	1760.0	1770.1	1767.5	1777.6	1767.5
7.5°	1765.1	1755.0	1757.5	1749.9	1760.0	1747.4	1755.0	1770.1	1760.0	1744.9
10°	1739.9	1734.8	1752.4	1727.2	1722.2	1732.3	1752.4	1737.3	1732.3	1737.3
12.5°	1714.6	1714.6	1722.2	1702.0	1704.5	1709.5	1719.6	1709.5	1714.6	1727.2
15°	1686.9	1681.8	1694.4	1679.3	1676.8	1671.8	1681.8	1681.8	1686.9	1679.3
17.5°	1654.1	1646.6	1646.6	1641.5	1638.9	1651.6	1656.6	1659.1	1661.7	1651.6
20°	1613.7	1611.3	1618.8	1611.3	1613.7	1616.3	1616.3	1611.3	1633.9	1606.2
22.5°	1570.8	1578.5	1568.4	1563.3	1568.4	1573.4	1573.4	1575.9	1570.8	1565.8
25°	1528.0	1533.1	1535.6	1520.4	1528.0	1520.4	1538.1	1540.6	1530.5	1535.6
27.5°	1490.2	1482.7	1480.1	1470.0	1475.1	1472.6	1475.1	1475.1	1490.2	1470.0
30°	1432.2	1424.6	1427.1	1419.6	1422.1	1419.6	1422.1	1422.1	1432.2	1429.7
32.5°	1376.7	1369.2	1371.7	1364.2	1364.2	1366.6	1361.6	1361.6	1369.2	1364.2
35°	1323.7	1306.1	1308.6	1306.1	1308.6	1298.5	1298.5	1296.1	1301.1	1288.4
37.5°	1248.1	1240.6	1238.0	1235.6	1238.0	1233.0	1238.0	1230.5	1238.0	1227.9
40°	1180.0	1175.0	1177.5	1162.4	1162.4	1164.9	1159.8	1157.4	1159.8	1169.9
42.5°	1112.0	1101.9	1096.9	1091.8	1094.3	1086.8	1084.2	1079.2	1084.2	1074.1
45°	1031.2	1031.2	1028.8	1016.1	1018.7	1018.7	1008.6	998.5	1001.0	1001.0
47.5°	958.2	953.2	950.6	938.0	935.5	933.0	922.8	915.3	915.3	907.7
50°	877.4	872.4	864.9	852.2	847.2	832.1	824.6	814.5	804.4	804.4
52.5°	801.8	784.1	774.1	753.9	746.4	738.8	718.6	711.1	703.5	696.0
55°	711.1	696.0	675.8	653.1	643.0	630.3	610.2	595.0	585.0	587.5
57.5°	622.8	597.6	577.5	547.2	534.6	526.9	506.8	486.6	476.5	476.5
60°	514.4	494.2	469.0	441.2	431.2	418.6	393.3	380.7	373.1	365.6
62.5°	411.0	395.9	373.1	337.9	330.3	317.7	300.1	285.0	277.4	277.4
65°	307.6	292.5	272.3	247.1	237.0	226.9	211.8	196.7	189.1	186.6
67.5°	216.9	199.2	181.6	161.4	153.8	148.8	133.6	123.6	118.5	115.9
70°	131.1	121.0	108.4	93.3	85.7	80.7	70.6	63.1	60.5	58.0
72.5°	68.1	60.5	50.4	40.3	35.3	30.2	25.2	20.2	17.7	17.7
75°	25.2	20.2	12.7	7.6	5.0	5.0	5.0	5.0	5.0	5.0
77.5°	5.0	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
80°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
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)