

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: **FLDSQ4C20D010 FEU4C209030 F4LC-SQ-LI**

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: FLDSQ4C20D010 FEU4C209030 F4LC-SQ-LI  
 Description: 4 INCH 2000 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 3000K, 90CRI LEDS AND F4LC-SQ TRIM WITH LI FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

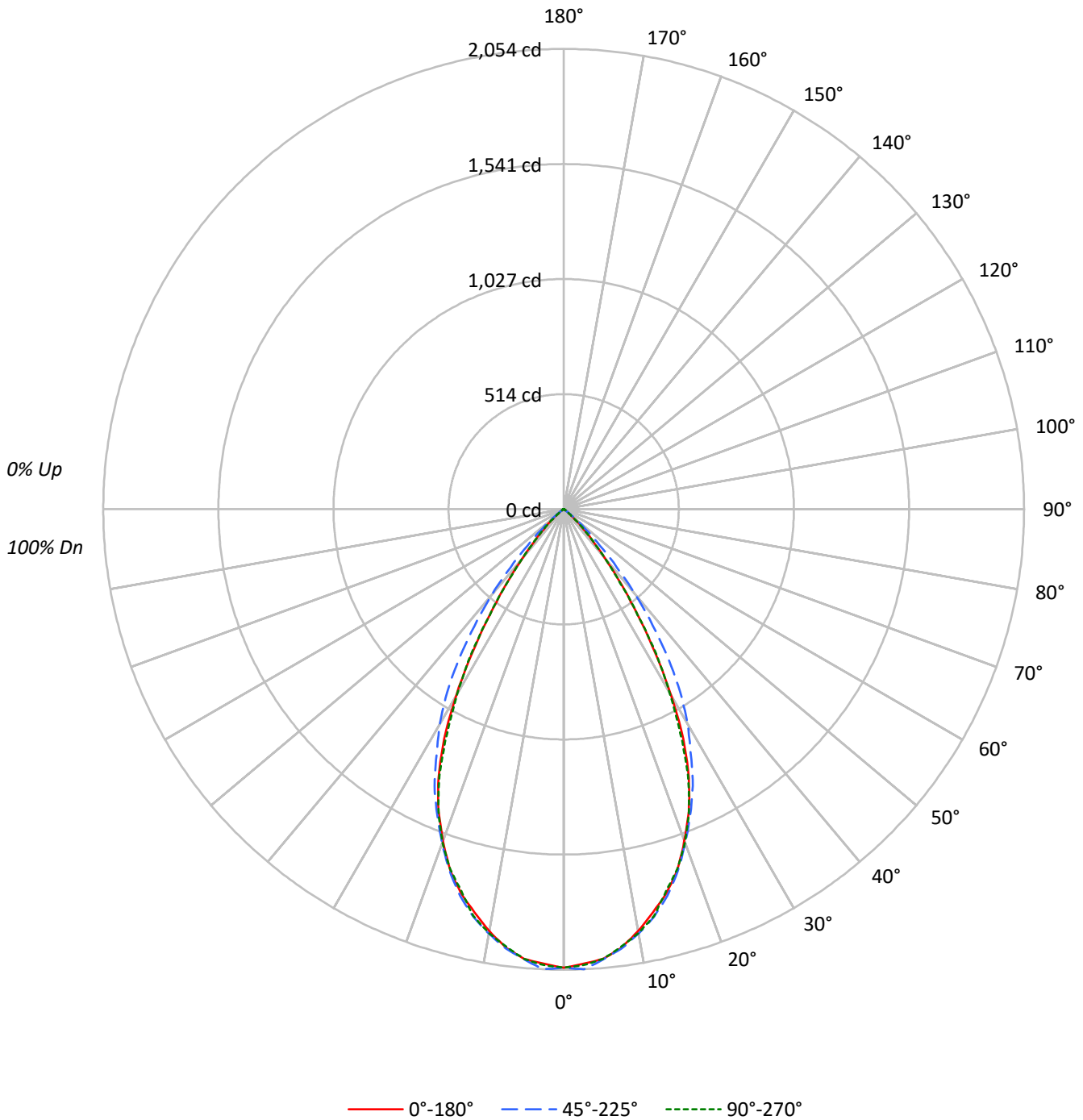
Lumens per Lamp: N/A  
 Luminaire Lumens: 1888.0 lumens  
 Efficiency: N/A  
 Efficacy: 86.6 lumens/watt  
 Spacing Criteria (0/90/45): 0.91 / 0.9 / 0.94  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

Input Watts (W): 21.8  
 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



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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	113	111	108	106	111	108	106	104	104	103	101		101	99	98		97	96	95	93
2	108	103	99	95	105	101	97	94	98	95	92		95	92	90		92	90	88	87
3	102	96	91	87	100	94	90	86	92	88	84		89	86	83		87	84	82	80
4	97	89	84	79	95	88	83	79	86	81	78		84	80	77		82	79	76	75
5	92	83	77	73	90	82	77	73	81	76	72		79	75	71		77	74	71	69
6	87	78	72	68	86	77	71	67	76	71	67		74	70	66		73	69	66	64
7	83	73	67	63	81	73	67	63	71	66	62		70	65	62		69	65	62	60
8	79	69	63	59	77	68	62	58	67	62	58		66	61	58		65	61	58	56
9	75	65	59	55	74	64	59	55	63	58	55		63	58	54		62	57	54	53
10	71	61	55	51	70	61	55	51	60	55	51		59	54	51		58	54	51	50

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

	0°	45°	90°
0°	197320	197320	197320
5°	195052	195303	195052
10°	187254	188401	188146
15°	177030	178328	176111
20°	161559	162760	162360
25°	140671	145099	139702
30°	106970	123036	105388
35°	67341	95646	67942
40°	36326	63168	35671
45°	17193	31207	17016
50°	6440	11694	6440
55°	3062	3718	2843
60°	2007	1756	2007
65°	1187	1187	1187
70°	733	1100	733
75°	485	485	485
80°	722	722	722
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	189.6	10.0
10°-20°	496.9	26.3
20°-30°	607.0	32.2
30°-40°	424.6	22.5
40°-50°	139.1	7.4
50°-60°	22.1	1.2
60°-70°	6.0	0.3
70°-80°	2.0	0.1
80°-90°	0.6	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°	1293.5	68.5
0°-40°	1718.1	91.0
0°-60°	1879.4	99.5
0°-90°	1888.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	1888.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	2045	2045	2045	2045	2045	
5°	2014	2014	2016	2004	2014	189
15°	1772	1779	1785	1773	1763	494
25°	1321	1341	1363	1338	1312	594
35°	572	675	812	665	577	365
45°	126	155	229	153	125	106
55°	18	20	22	20	17	18
65°	5	6	5	6	5	6
75°	1	1	1	1	1	2
85°	0	0	0	0	0	1
90°	0	0	0	0	0	

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

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0
2.5°	2029.4	2043.7	2039.8	2048.9	2048.9	2038.5	2041.1	2045.0	2050.2	2054.1	2022.9
5°	2013.8	2026.8	2015.1	2028.1	2020.3	2008.6	2028.1	2017.7	2024.2	2016.4	2021.6
7.5°	1972.3	1993.0	1969.7	1985.2	1980.0	1973.5	1981.3	1978.7	1982.6	1976.1	1961.9
10°	1911.2	1928.1	1912.5	1934.6	1924.2	1917.7	1924.2	1930.7	1929.4	1922.9	1930.7
12.5°	1841.0	1860.5	1852.7	1865.7	1854.0	1854.0	1869.6	1865.7	1867.0	1861.8	1870.9
15°	1772.2	1786.5	1774.8	1791.7	1786.5	1772.2	1778.6	1778.6	1789.1	1785.2	1774.8
17.5°	1686.4	1698.1	1685.1	1689.0	1683.8	1681.2	1708.5	1690.3	1700.7	1692.9	1694.2
20°	1573.4	1578.6	1574.7	1585.1	1578.6	1586.4	1583.8	1581.2	1581.2	1585.1	1576.0
22.5°	1459.0	1459.0	1463.0	1465.6	1470.7	1463.0	1478.5	1465.6	1466.8	1475.9	1473.3
25°	1321.3	1317.4	1326.5	1339.5	1344.7	1338.2	1359.0	1348.6	1356.4	1362.9	1348.6
27.5°	1153.7	1153.7	1162.8	1184.9	1188.8	1196.6	1225.2	1225.2	1235.6	1226.5	1236.9
30°	960.1	974.4	986.1	1014.7	1023.8	1040.7	1070.6	1084.9	1108.3	1104.3	1099.1
32.5°	761.4	780.9	782.1	812.0	836.7	865.3	905.6	939.3	956.3	967.9	954.9
35°	571.7	583.4	593.8	614.5	656.1	693.8	730.2	774.3	804.2	812.0	800.3
37.5°	418.4	421.0	431.4	450.8	482.0	518.4	562.6	610.6	641.8	653.5	640.5
40°	288.4	291.0	296.2	313.1	339.1	365.1	400.2	449.5	478.1	501.5	484.6
42.5°	193.6	196.2	201.4	214.4	228.7	253.3	280.6	311.8	339.1	349.5	340.4
45°	126.0	126.0	128.6	137.7	145.5	165.0	184.5	204.0	222.2	228.7	222.2
47.5°	74.1	75.3	77.9	84.5	93.5	101.3	115.6	128.6	133.8	139.0	136.4
50°	42.9	42.9	46.8	50.7	57.2	62.4	67.5	72.7	75.3	77.9	75.3
52.5°	23.4	24.7	26.0	27.3	29.9	35.1	39.0	39.0	40.3	41.6	40.3
55°	18.2	18.2	18.2	18.2	19.5	19.5	19.5	20.8	20.8	22.1	20.8
57.5°	13.0	13.0	13.0	14.3	14.3	14.3	13.0	13.0	13.0	13.0	13.0
60°	10.4	10.4	10.4	10.4	10.4	10.4	10.4	9.1	9.1	9.1	9.1
62.5°	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
65°	5.2	5.2	6.5	6.5	6.5	6.5	6.5	5.2	5.2	5.2	5.2
67.5°	3.9	3.9	3.9	3.9	5.2	5.2	3.9	3.9	3.9	3.9	3.9
70°	2.6	2.6	2.6	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
72.5°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
75°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
77.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
80°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	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°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
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):**

	55°	60°	65°	70°	75°	80°	85°	90°
0°	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0	2045.0
2.5°	2045.0	2022.9	2025.5	2037.2	2030.7	2037.2	2035.9	2035.9
5°	2022.9	2016.4	2006.0	2002.1	2009.9	2026.8	2024.2	2013.8
7.5°	1981.3	1964.5	1976.1	1981.3	1974.9	1985.2	1990.4	1968.3
10°	1932.0	1925.5	1922.9	1925.5	1922.9	1933.3	1920.3	1920.3
12.5°	1861.8	1851.4	1851.4	1867.0	1857.9	1850.1	1860.5	1859.2
15°	1791.7	1770.8	1770.8	1776.0	1780.0	1774.8	1776.0	1763.0
17.5°	1687.7	1681.2	1672.1	1686.4	1690.3	1685.1	1689.0	1682.5
20°	1590.3	1590.3	1573.4	1579.9	1585.1	1589.0	1591.6	1581.2
22.5°	1465.6	1468.2	1456.4	1469.4	1473.3	1460.4	1463.0	1460.4
25°	1351.2	1349.9	1340.8	1335.6	1338.2	1333.0	1331.7	1312.2
27.5°	1225.2	1212.2	1192.7	1197.9	1175.8	1157.6	1157.6	1127.7
30°	1088.7	1066.7	1040.7	1014.7	995.2	974.4	962.7	945.9
32.5°	928.9	899.1	866.6	831.5	809.4	778.3	761.4	770.5
35°	770.5	726.3	682.1	647.0	613.2	595.0	574.2	576.8
37.5°	617.1	554.8	515.8	478.1	449.5	426.2	417.0	414.5
40°	450.8	401.5	362.5	335.2	315.7	297.5	287.2	283.2
42.5°	311.8	276.8	245.5	223.5	210.5	198.8	193.6	192.3
45°	202.7	181.9	161.1	145.5	135.1	127.4	126.0	124.7
47.5°	127.4	116.9	103.9	92.3	83.1	77.9	74.1	74.1
50°	72.7	68.9	62.4	55.9	50.7	48.1	44.2	42.9
52.5°	39.0	39.0	36.4	31.2	27.3	24.7	24.7	23.4
55°	20.8	20.8	19.5	19.5	18.2	18.2	18.2	16.9
57.5°	13.0	13.0	14.3	14.3	13.0	13.0	13.0	13.0
60°	9.1	10.4	10.4	10.4	10.4	10.4	10.4	10.4
62.5°	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
65°	5.2	6.5	6.5	6.5	6.5	5.2	5.2	5.2
67.5°	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
70°	3.9	3.9	3.9	3.9	3.9	2.6	2.6	2.6
72.5°	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
75°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
77.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
80°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
82.5°	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
87.5°	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)