

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-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: FLDSQ4C45D010 FEU4C459035 F4LC-SQ-LI  
 Description: 4 INCH 4500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 3500K, 90CRI LEDS AND F4LC-SQ TRIM WITH LI FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

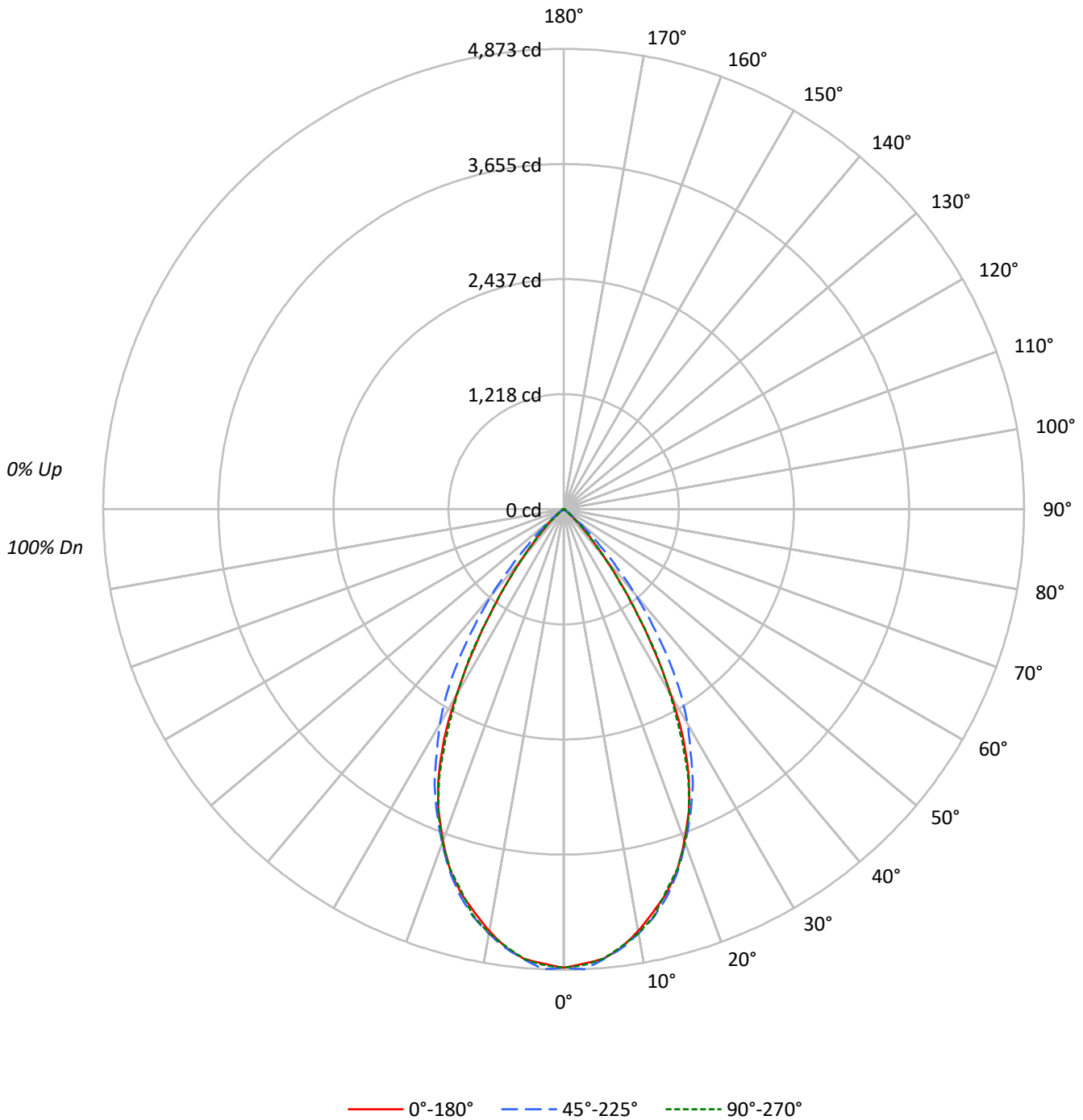
Lumens per Lamp: N/A  
 Luminaire Lumens: 4479.0 lumens  
 Efficiency: N/A  
 Efficacy: 90.3 lumens/watt  
 Spacing Criteria (0/90/45): 0.91 / 0.9 / 0.94  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

Input Watts (W): 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



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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				
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°	468116	468116	468116
5°	462737	463337	462737
10°	444229	446953	446346
15°	419969	423045	417811
20°	383268	386113	385168
25°	333732	344229	331432
30°	253772	291898	250006
35°	159748	226913	161197
40°	86180	149864	84631
45°	40800	74027	40364
50°	15281	27755	15281
55°	7250	8815	6746
60°	4767	4168	4767
65°	2808	2808	2808
70°	1749	2624	1749
75°	1156	1156	1156
80°	1723	1723	1723
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	449.8	10.0
10°-20°	1178.8	26.3
20°-30°	1440.1	32.2
30°-40°	1007.2	22.5
40°-50°	330.1	7.4
50°-60°	52.5	1.2
60°-70°	14.3	0.3
70°-80°	4.8	0.1
80°-90°	1.3	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°	3068.7	68.5
0°-40°	4076.0	91.0
0°-60°	4458.5	99.5
0°-90°	4479.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4479.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4852	4852	4852	4852	4852	
5°	4778	4779	4784	4754	4778	448
15°	4204	4221	4235	4207	4183	1173
25°	3135	3182	3233	3175	3113	1408
35°	1356	1601	1926	1577	1368	865
45°	299	368	542	364	296	251
55°	43	46	52	46	40	43
65°	12	16	12	16	12	14
75°	3	3	3	3	3	4
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°	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5
2.5°	4814.5	4848.4	4839.1	4860.8	4860.8	4836.1	4842.3	4851.5	4863.8	4873.1	4799.0
5°	4777.5	4808.3	4780.5	4811.3	4792.8	4765.2	4811.3	4786.7	4802.1	4783.7	4796.0
7.5°	4678.9	4728.2	4672.7	4709.7	4697.4	4681.9	4700.4	4694.2	4703.5	4688.1	4654.2
10°	4534.0	4574.1	4537.1	4589.5	4564.8	4549.5	4564.8	4580.3	4577.1	4561.8	4580.3
12.5°	4367.6	4413.7	4395.3	4426.1	4398.4	4398.4	4435.4	4426.1	4429.2	4416.9	4438.4
15°	4204.2	4238.1	4210.4	4250.5	4238.1	4204.2	4219.5	4219.5	4244.3	4235.0	4210.4
17.5°	4000.8	4028.5	3997.7	4007.0	3994.6	3988.5	4053.1	4010.0	4034.6	4016.2	4019.3
20°	3732.6	3745.0	3735.7	3760.3	3745.0	3763.5	3757.3	3751.1	3751.1	3760.3	3738.8
22.5°	3461.3	3461.3	3470.6	3476.8	3489.1	3470.6	3507.6	3476.8	3479.8	3501.5	3495.3
25°	3134.7	3125.4	3147.0	3177.8	3190.2	3174.7	3224.0	3199.3	3217.8	3233.3	3199.3
27.5°	2737.1	2737.1	2758.6	2811.1	2820.2	2838.7	2906.5	2906.5	2931.2	2909.7	2934.3
30°	2277.7	2311.7	2339.4	2407.2	2428.8	2468.9	2539.7	2573.7	2629.2	2619.9	2607.5
32.5°	1806.2	1852.5	1855.5	1926.4	1984.9	2052.7	2148.3	2228.4	2268.6	2296.2	2265.4
35°	1356.2	1384.0	1408.6	1457.9	1556.5	1646.0	1732.2	1837.0	1908.0	1926.4	1898.6
37.5°	992.5	998.7	1023.3	1069.5	1143.5	1229.9	1334.6	1448.6	1522.7	1550.4	1519.5
40°	684.2	690.4	702.7	742.9	804.5	866.1	949.4	1066.5	1134.3	1189.8	1149.6
42.5°	459.2	465.4	477.7	508.5	542.5	601.0	665.8	739.7	804.5	829.1	807.5
45°	299.0	299.0	305.1	326.8	345.3	391.4	437.7	483.9	527.0	542.5	527.0
47.5°	175.7	178.7	184.9	200.4	221.9	240.4	274.3	305.1	317.5	329.8	323.6
50°	101.8	101.8	110.9	120.2	135.6	147.9	160.2	172.6	178.7	184.9	178.7
52.5°	55.5	58.6	61.6	64.8	70.9	83.3	92.4	92.4	95.6	98.6	95.6
55°	43.1	43.1	43.1	43.1	46.3	46.3	46.3	49.3	49.3	52.4	49.3
57.5°	30.8	30.8	30.8	34.0	34.0	34.0	30.8	30.8	30.8	30.8	30.8
60°	24.7	24.7	24.7	24.7	24.7	24.7	24.7	21.6	21.6	21.6	21.6
62.5°	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
65°	12.3	12.3	15.5	15.5	15.5	15.5	15.5	12.3	12.3	12.3	12.3
67.5°	9.3	9.3	9.3	9.3	12.3	12.3	9.3	9.3	9.3	9.3	9.3
70°	6.2	6.2	6.2	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
72.5°	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
75°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
77.5°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
80°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
82.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	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°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
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):**

	55°	60°	65°	70°	75°	80°	85°	90°
0°	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5	4851.5
2.5°	4851.5	4799.0	4805.2	4833.0	4817.5	4833.0	4829.9	4829.9
5°	4799.0	4783.7	4759.0	4749.7	4768.2	4808.3	4802.1	4777.5
7.5°	4700.4	4660.4	4688.1	4700.4	4685.0	4709.7	4722.0	4669.6
10°	4583.3	4567.9	4561.8	4567.9	4561.8	4586.4	4555.6	4555.6
12.5°	4416.9	4392.2	4392.2	4429.2	4407.6	4389.1	4413.7	4410.7
15°	4250.5	4201.0	4201.0	4213.4	4222.7	4210.4	4213.4	4182.6
17.5°	4003.8	3988.5	3966.8	4000.8	4010.0	3997.7	4007.0	3991.5
20°	3772.6	3772.6	3732.6	3748.0	3760.3	3769.6	3775.8	3751.1
22.5°	3476.8	3483.0	3455.2	3486.0	3495.3	3464.5	3470.6	3464.5
25°	3205.5	3202.5	3180.8	3168.5	3174.7	3162.4	3159.3	3113.1
27.5°	2906.5	2875.7	2829.5	2841.9	2789.4	2746.3	2746.3	2675.3
30°	2582.9	2530.6	2468.9	2407.2	2361.0	2311.7	2283.9	2243.9
32.5°	2203.8	2133.0	2055.9	1972.6	1920.3	1846.3	1806.2	1827.8
35°	1827.8	1722.9	1618.2	1535.0	1454.8	1411.6	1362.3	1368.5
37.5°	1464.1	1316.2	1223.7	1134.3	1066.5	1011.0	989.4	983.2
40°	1069.5	952.4	860.0	795.2	749.0	705.9	681.2	671.9
42.5°	739.7	656.6	582.5	530.2	499.3	471.6	459.2	456.2
45°	480.9	431.5	382.2	345.3	320.6	302.1	299.0	295.8
47.5°	302.1	277.3	246.5	218.9	197.2	184.9	175.7	175.7
50°	172.6	163.4	147.9	132.6	120.2	114.1	104.8	101.8
52.5°	92.4	92.4	86.3	74.0	64.8	58.6	58.6	55.5
55°	49.3	49.3	46.3	46.3	43.1	43.1	43.1	40.1
57.5°	30.8	30.8	34.0	34.0	30.8	30.8	30.8	30.8
60°	21.6	24.7	24.7	24.7	24.7	24.7	24.7	24.7
62.5°	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
65°	12.3	15.5	15.5	15.5	15.5	12.3	12.3	12.3
67.5°	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
70°	9.3	9.3	9.3	9.3	9.3	6.2	6.2	6.2
72.5°	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
75°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
77.5°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
80°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
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°	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(END OF REPORT)