

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 FEU4C459030 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 FEU4C459030 F4LC-SQ-LI  
 Description: 4 INCH 4500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 3000K, 90CRI LEDS AND F4LC-SQ TRIM WITH LI FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

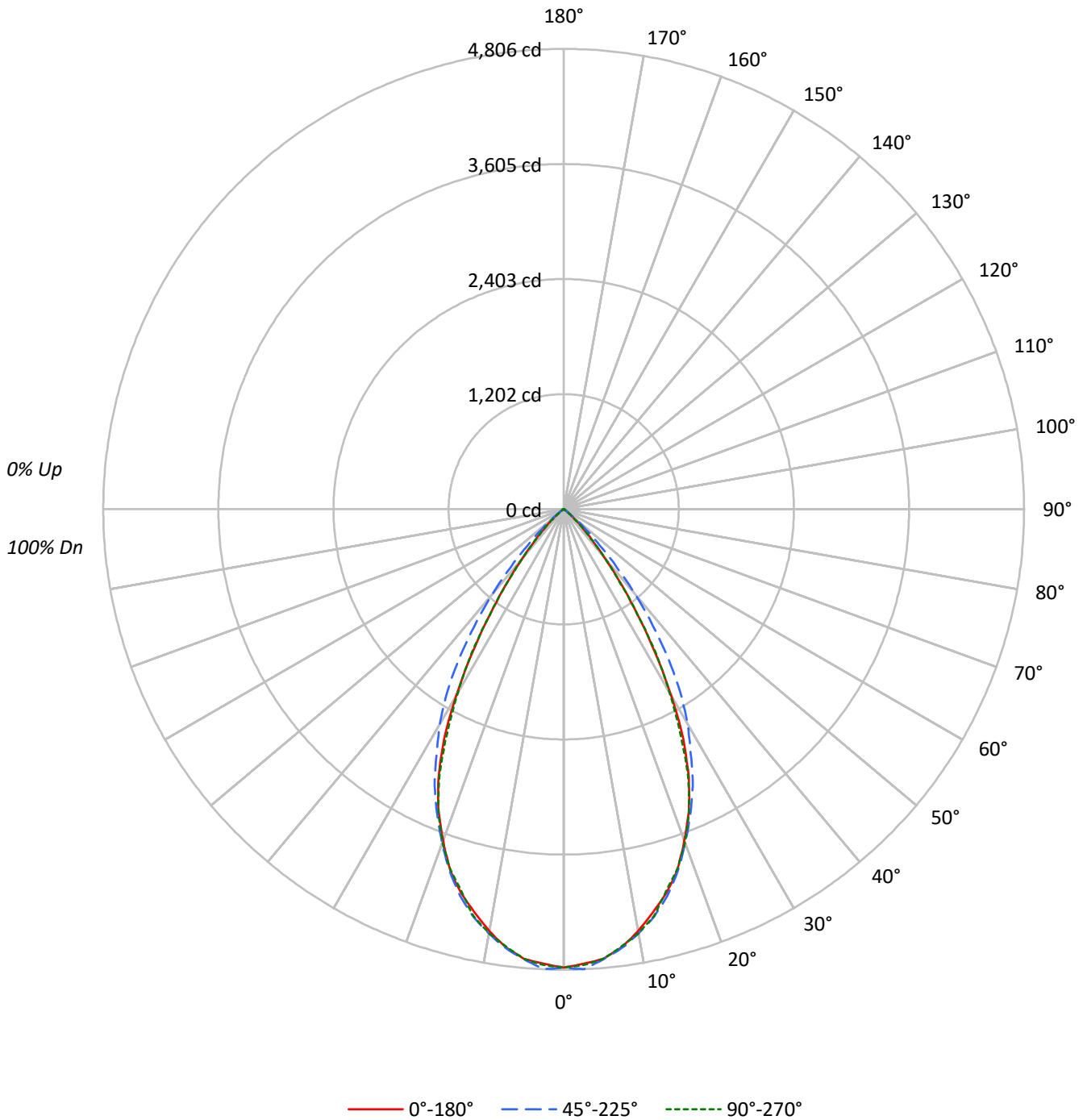
Lumens per Lamp: N/A  
 Luminaire Lumens: 4417.0 lumens  
 Efficiency: N/A  
 Efficacy: 89.1 lumens/watt  
 Spacing Criteria (0/90/45): 0.91 / 0.9 / 0.94  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

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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CATALOG NUMBER: FLDSQ4C45D010 FEU4C459030 F4LC-SQ-LI

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

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

	0°	45°	90°
0°	461632	461632	461632
5°	456334	456915	456334
10°	438077	440761	440173
15°	414155	417192	412027
20°	377970	380773	379839
25°	329111	339460	326844
30°	250262	287854	246541
35°	157534	223780	158959
40°	84996	147786	83459
45°	40227	73004	39804
50°	15056	27365	15056
55°	7149	8697	6662
60°	4689	4110	4689
65°	2785	2785	2785
70°	1721	2595	1721
75°	1156	1156	1156
80°	1723	1723	1723
85°	0	0	0

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**ZONAL LUMENS:**

Zone	Lumens	% Fixture
0°-10°	443.6	10.0
10°-20°	1162.5	26.3
20°-30°	1420.2	32.2
30°-40°	993.3	22.5
40°-50°	325.5	7.4
50°-60°	51.8	1.2
60°-70°	14.1	0.3
70°-80°	4.7	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°	3026.3	68.5
0°-40°	4019.6	91.0
0°-60°	4396.8	99.5
0°-90°	4417.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	4417.0	100.0

**CANDELA DISTRIBUTION:**

	0°	22.5°	45°	67.5°	90°	Flux
0°	4784	4784	4784	4784	4784	
5°	4711	4713	4717	4689	4711	442
15°	4146	4163	4176	4149	4125	1156
25°	3091	3138	3188	3131	3070	1389
35°	1337	1579	1900	1555	1350	853
45°	295	363	535	359	292	247
55°	42	46	52	46	40	42
65°	12	15	12	15	12	13
75°	3	3	3	3	3	4
85°	0	0	0	0	0	1
90°	0	0	0	0	0	

TEST NUMBER: P#  
 CATALOG NUMBER: FLDSQ4C45D010 FEU4C459030 F4LC-SQ-LI

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3
2.5°	4747.8	4781.3	4772.1	4793.5	4793.5	4769.2	4775.2	4784.3	4796.5	4805.6	4732.6
5°	4711.4	4741.8	4714.3	4744.7	4726.5	4699.2	4744.7	4720.4	4735.7	4717.4	4729.6
7.5°	4614.1	4662.7	4608.0	4644.5	4632.4	4617.1	4635.3	4629.3	4638.4	4623.2	4589.8
10°	4471.2	4510.8	4474.3	4525.9	4501.6	4486.5	4501.6	4516.9	4513.8	4498.6	4516.9
12.5°	4307.1	4352.6	4334.4	4364.8	4337.5	4337.5	4374.0	4364.8	4367.9	4355.7	4377.0
15°	4146.0	4179.5	4152.1	4191.6	4179.5	4146.0	4161.1	4161.1	4185.6	4176.4	4152.1
17.5°	3945.4	3972.7	3942.3	3951.5	3939.3	3933.3	3997.0	3954.5	3978.8	3960.6	3963.7
20°	3681.0	3693.1	3684.0	3708.3	3693.1	3711.4	3705.3	3699.2	3699.2	3708.3	3687.1
22.5°	3413.4	3413.4	3422.6	3428.7	3440.8	3422.6	3459.1	3428.7	3431.7	3453.0	3446.9
25°	3091.3	3082.1	3103.4	3133.8	3146.0	3130.7	3179.4	3155.1	3173.3	3188.5	3155.1
27.5°	2699.2	2699.2	2720.4	2772.1	2781.2	2799.4	2866.3	2866.3	2890.6	2869.4	2893.7
30°	2246.2	2279.7	2307.0	2373.9	2395.2	2434.8	2504.6	2538.1	2592.8	2583.6	2571.4
32.5°	1781.2	1826.8	1829.8	1899.8	1957.5	2024.3	2118.6	2197.6	2237.2	2264.5	2234.1
35°	1337.4	1364.8	1389.1	1437.7	1535.0	1623.2	1708.3	1811.6	1881.5	1899.8	1872.4
37.5°	978.8	984.9	1009.2	1054.7	1127.6	1212.8	1316.2	1428.6	1501.6	1528.9	1498.5
40°	674.8	680.8	693.0	732.6	793.4	854.1	936.2	1051.7	1118.6	1173.3	1133.7
42.5°	452.9	458.9	471.1	501.5	535.0	592.7	656.5	729.5	793.4	817.7	796.3
45°	294.8	294.8	300.9	322.3	340.5	386.0	431.7	477.2	519.7	535.0	519.7
47.5°	173.3	176.3	182.3	197.6	218.8	237.0	270.5	300.9	313.1	325.2	319.2
50°	100.3	100.3	109.4	118.6	133.7	145.9	158.0	170.2	176.3	182.3	176.3
52.5°	54.7	57.8	60.8	63.9	70.0	82.1	91.2	91.2	94.3	97.2	94.3
55°	42.5	42.5	42.5	42.5	45.6	45.6	45.6	48.6	48.6	51.7	48.6
57.5°	30.4	30.4	30.4	33.5	33.5	33.5	30.4	30.4	30.4	30.4	30.4
60°	24.3	24.3	24.3	24.3	24.3	24.3	24.3	21.3	21.3	21.3	21.3
62.5°	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
65°	12.2	12.2	15.3	15.3	15.3	15.3	15.3	12.2	12.2	12.2	12.2
67.5°	9.2	9.2	9.2	9.2	12.2	12.2	9.2	9.2	9.2	9.2	9.2
70°	6.1	6.1	6.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
72.5°	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
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°	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3	4784.3
2.5°	4784.3	4732.6	4738.7	4766.1	4750.8	4766.1	4763.1	4763.1
5°	4732.6	4717.4	4693.1	4684.0	4702.2	4741.8	4735.7	4711.4
7.5°	4635.3	4595.9	4623.2	4635.3	4620.2	4644.5	4656.7	4604.9
10°	4519.8	4504.7	4498.6	4504.7	4498.6	4522.9	4492.6	4492.6
12.5°	4355.7	4331.4	4331.4	4367.9	4346.6	4328.3	4352.6	4349.7
15°	4191.6	4142.9	4142.9	4155.1	4164.2	4152.1	4155.1	4124.7
17.5°	3948.4	3933.3	3911.9	3945.4	3954.5	3942.3	3951.5	3936.2
20°	3720.4	3720.4	3681.0	3696.1	3708.3	3717.4	3723.5	3699.2
22.5°	3428.7	3434.8	3407.3	3437.7	3446.9	3416.5	3422.6	3416.5
25°	3161.1	3158.1	3136.8	3124.7	3130.7	3118.6	3115.6	3070.0
27.5°	2866.3	2835.9	2790.4	2802.5	2750.8	2708.3	2708.3	2638.3
30°	2547.1	2495.5	2434.8	2373.9	2328.3	2279.7	2252.3	2212.8
32.5°	2173.3	2103.4	2027.4	1945.3	1893.7	1820.8	1781.2	1802.5
35°	1802.5	1699.1	1595.8	1513.8	1434.6	1392.1	1343.5	1349.5
37.5°	1443.8	1297.9	1206.8	1118.6	1051.7	997.0	975.7	969.6
40°	1054.7	939.2	848.1	784.2	738.6	696.1	671.8	662.6
42.5°	729.5	647.5	574.4	522.8	492.4	465.0	452.9	449.9
45°	474.2	425.6	377.0	340.5	316.2	297.9	294.8	291.7
47.5°	297.9	273.5	243.1	215.8	194.5	182.3	173.3	173.3
50°	170.2	161.1	145.9	130.7	118.6	112.5	103.3	100.3
52.5°	91.2	91.2	85.1	72.9	63.9	57.8	57.8	54.7
55°	48.6	48.6	45.6	45.6	42.5	42.5	42.5	39.6
57.5°	30.4	30.4	33.5	33.5	30.4	30.4	30.4	30.4
60°	21.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
62.5°	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
65°	12.2	15.3	15.3	15.3	15.3	12.2	12.2	12.2
67.5°	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
70°	9.2	9.2	9.2	9.2	9.2	6.1	6.1	6.1
72.5°	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
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)