

Scaled data based on original data using  
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: 168P186

Luminaire Tested: **FMS24LP-N-432-80/86**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: 168P186  
Test Lab:  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: FMS24LP-N-432-80/86  
Description: FAIL-SAFE FMS SERIES LUMINAIRE  
Light Source: FOUR - FO32/35K - 2800 LUMENS EA. - 32 WATTS EA.  
Ballast/Driver: ADVANCE REL-4P32-SC

**Summary**

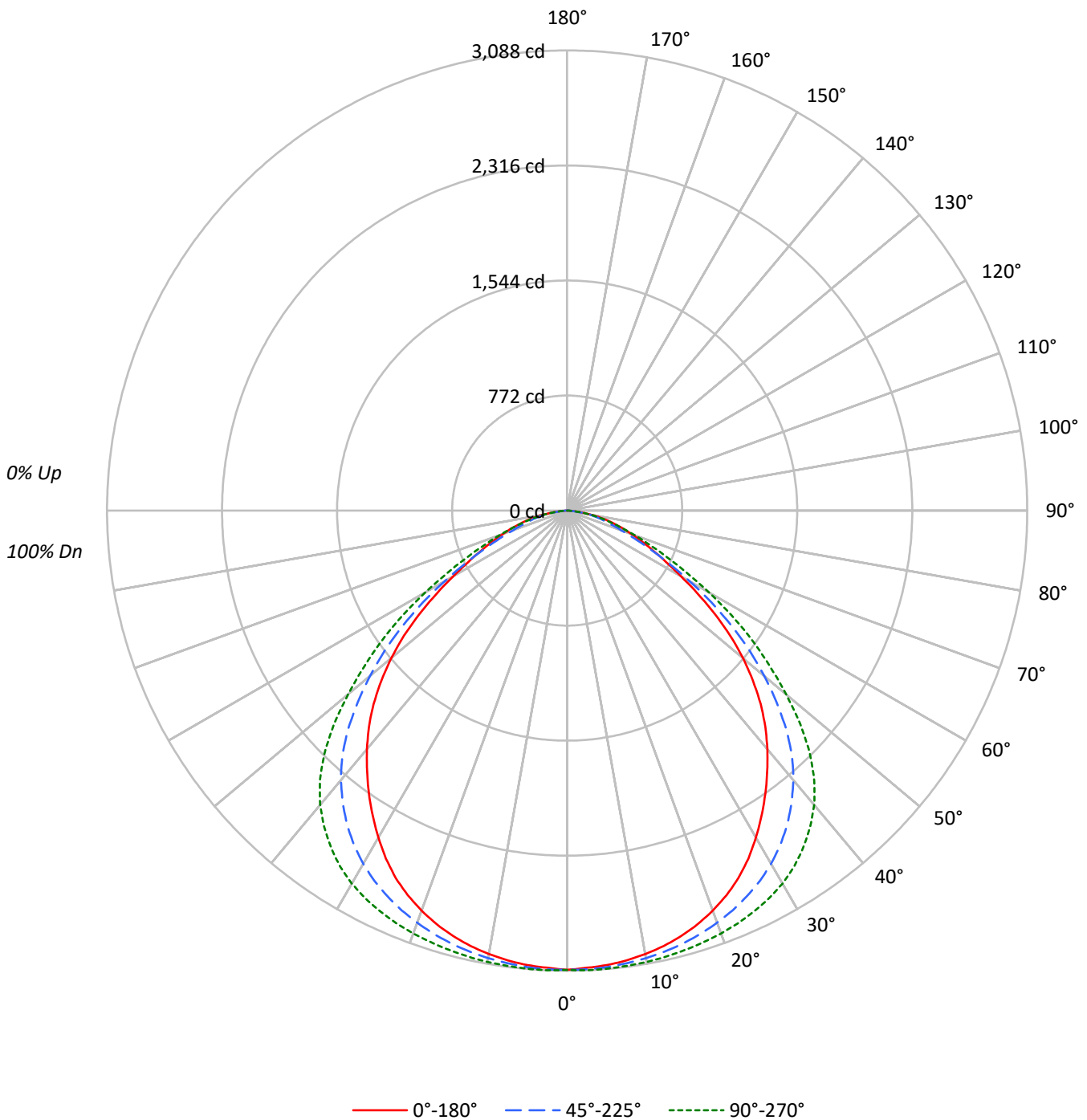
Lumens per Lamp: 2800 (4 lamps)  
Luminaire Lumens: 7868.9 lumens  
Efficiency: 70.3%  
Efficacy: 72.9 lumens/watt  
Spacing Criteria (0/90/45): 1.22 / 1.38 / 1.39  
Luminous Opening: Rectangular (W 1.54' x L: 3.69' x H: 0')  
CIE Type: Direct

Input Watts (W): 108  
Input Voltage (V): NR  
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

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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	84	84	84	84	82	82	82	82	78	78	78	75	75	75	72	72	72	70
1	77	74	72	69	75	73	70	68	70	68	66	67	66	64	65	63	62	61
2	71	66	61	58	69	64	60	57	62	59	56	60	57	55	58	55	53	52
3	65	58	53	49	63	57	52	48	55	51	48	53	50	47	52	49	46	45
4	60	52	46	42	58	51	46	42	49	45	41	48	44	41	46	43	40	39
5	55	47	41	36	54	46	40	36	45	40	36	43	39	35	42	38	35	34
6	51	42	36	32	50	42	36	32	40	35	32	39	35	31	38	34	31	30
7	48	38	33	28	46	38	32	28	37	32	28	36	31	28	35	31	28	26
8	44	35	29	25	43	35	29	25	34	29	25	33	28	25	32	28	25	24
9	41	32	27	23	40	32	26	23	31	26	23	30	26	23	30	25	22	21
10	39	30	24	21	38	29	24	21	29	24	21	28	24	21	27	23	20	19

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

	0°	45°	90°
0°	5838	5838	5838
5°	5822	5847	5868
10°	5813	5866	5916
15°	5797	5897	5987
20°	5759	5932	6088
25°	5687	5967	6203
30°	5542	5986	6321
35°	5362	5952	6387
40°	5168	5840	6377
45°	4921	5572	6172
50°	4538	5092	5652
55°	3996	4445	5003
60°	3338	3595	4160
65°	2855	2770	3294
70°	2537	2143	2653
75°	2291	1844	2181
80°	1833	1582	1723
85°	978	913	913



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

Zone	Lumens	% Fixture	% Lamp		0°	22.5°	45°	67.5°	90°	Flux
0°-10°	292.6	3.7	2.6	0°	3082	3082	3082	3082	3082	
10°-20°	849.2	10.8	7.6	5°	3062	3066	3075	3080	3086	291
20°-30°	1313.1	16.7	11.7	15°	2956	2971	3007	3038	3053	834
30°-40°	1596.7	20.3	14.3	25°	2721	2763	2855	2936	2968	1250
40°-50°	1587.3	20.2	14.2	35°	2319	2401	2574	2711	2762	1450
50°-60°	1201.0	15.3	10.7	45°	1837	1909	2080	2230	2304	1410
60°-70°	667.0	8.5	6.0	55°	1210	1239	1346	1437	1515	1079
70°-80°	301.9	3.8	2.7	65°	637	644	618	686	735	642
80°-90°	60.2	0.8	0.5	75°	313	288	252	283	298	329
90°-100°	0.0	0.0	0.0	85°	45	44	42	42	42	64
100°-110°	0.0	0.0	0.0	90°	0	0	0	0	0	2
110°-120°	0.0	0.0	0.0	95°	0	0	0	0	0	0
120°-130°	0.0	0.0	0.0	105°	0	0	0	0	0	0
130°-140°	0.0	0.0	0.0	115°	0	0	0	0	0	0
140°-150°	0.0	0.0	0.0	125°	0	0	0	0	0	0
150°-160°	0.0	0.0	0.0	135°	0	0	0	0	0	0
160°-170°	0.0	0.0	0.0	145°	0	0	0	0	0	0
170°-180°	0.0	0.0	0.0	155°	0	0	0	0	0	0
0°-30°	2454.8	31.2	21.9	165°	0	0	0	0	0	0
0°-40°	4051.5	51.5	36.2	175°	0	0	0	0	0	0
0°-60°	6839.8	86.9	61.1	180°	0	0	0	0	0	0
0°-90°	7868.9	100.0	70.3							
90°-120°	0.0	0.0	0.0							
90°-150°	0.0	0.0	0.0							
90°-180°	0.0	0.0	0.0							
0°-180°	7868.9	100.0	70.3							



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	3082	3082	3082	3082	3082
2.5°	3071	3074	3081	3084	3088
5°	3062	3066	3075	3080	3086
7.5°	3045	3051	3064	3075	3081
10°	3022	3031	3050	3066	3076
12.5°	2993	3004	3031	3054	3066
15°	2956	2971	3007	3038	3053
17.5°	2911	2930	2978	3019	3038
20°	2857	2883	2943	2996	3020
22.5°	2794	2828	2903	2968	2997
25°	2721	2763	2855	2936	2968
27.5°	2633	2687	2801	2896	2934
30°	2534	2599	2737	2849	2890
32.5°	2428	2503	2662	2790	2834
35°	2319	2401	2574	2711	2762
37.5°	2206	2295	2473	2619	2678
40°	2090	2179	2362	2513	2579
42.5°	1969	2052	2234	2385	2455
45°	1837	1909	2080	2230	2304
47.5°	1692	1752	1907	2049	2122
50°	1540	1585	1728	1855	1918
52.5°	1380	1413	1542	1649	1714
55°	1210	1239	1346	1437	1515
57.5°	1038	1072	1147	1222	1307
60°	881	915	949	1021	1098
62.5°	748	769	771	841	904
65°	637	644	618	686	735
67.5°	542	539	489	555	598
70°	458	447	387	447	479
72.5°	384	365	309	358	380
75°	313	288	252	283	298
77.5°	240	215	201	214	226
80°	168	150	145	148	158
82.5°	101	92	88	89	94
85°	45	44	42	42	42
87.5°	11	12	11	11	10
90°	0	0	0	0	0
92.5°	0	0	0	0	0
95°	0	0	0	0	0
97.5°	0	0	0	0	0
100°	0	0	0	0	0
102.5°	0	0	0	0	0
105°	0	0	0	0	0
107.5°	0	0	0	0	0
110°	0	0	0	0	0



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	0	0	0	0	0
115°	0	0	0	0	0
117.5°	0	0	0	0	0
120°	0	0	0	0	0
122.5°	0	0	0	0	0
125°	0	0	0	0	0
127.5°	0	0	0	0	0
130°	0	0	0	0	0
132.5°	0	0	0	0	0
135°	0	0	0	0	0
137.5°	0	0	0	0	0
140°	0	0	0	0	0
142.5°	0	0	0	0	0
145°	0	0	0	0	0
147.5°	0	0	0	0	0
150°	0	0	0	0	0
152.5°	0	0	0	0	0
155°	0	0	0	0	0
157.5°	0	0	0	0	0
160°	0	0	0	0	0
162.5°	0	0	0	0	0
165°	0	0	0	0	0
167.5°	0	0	0	0	0
170°	0	0	0	0	0
172.5°	0	0	0	0	0
175°	0	0	0	0	0
177.5°	0	0	0	0	0
180°	0	0	0	0	0

(END OF REPORT)