

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: 768569

Luminaire Tested: **TRO11-C-D170MH**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: 768569
Test Lab:
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: TRO11-C-D170MH
Description: FAIL-SAFE
Light Source: 70W MH CL HOR ED-17 6000 LUMENS
Ballast/Driver: -

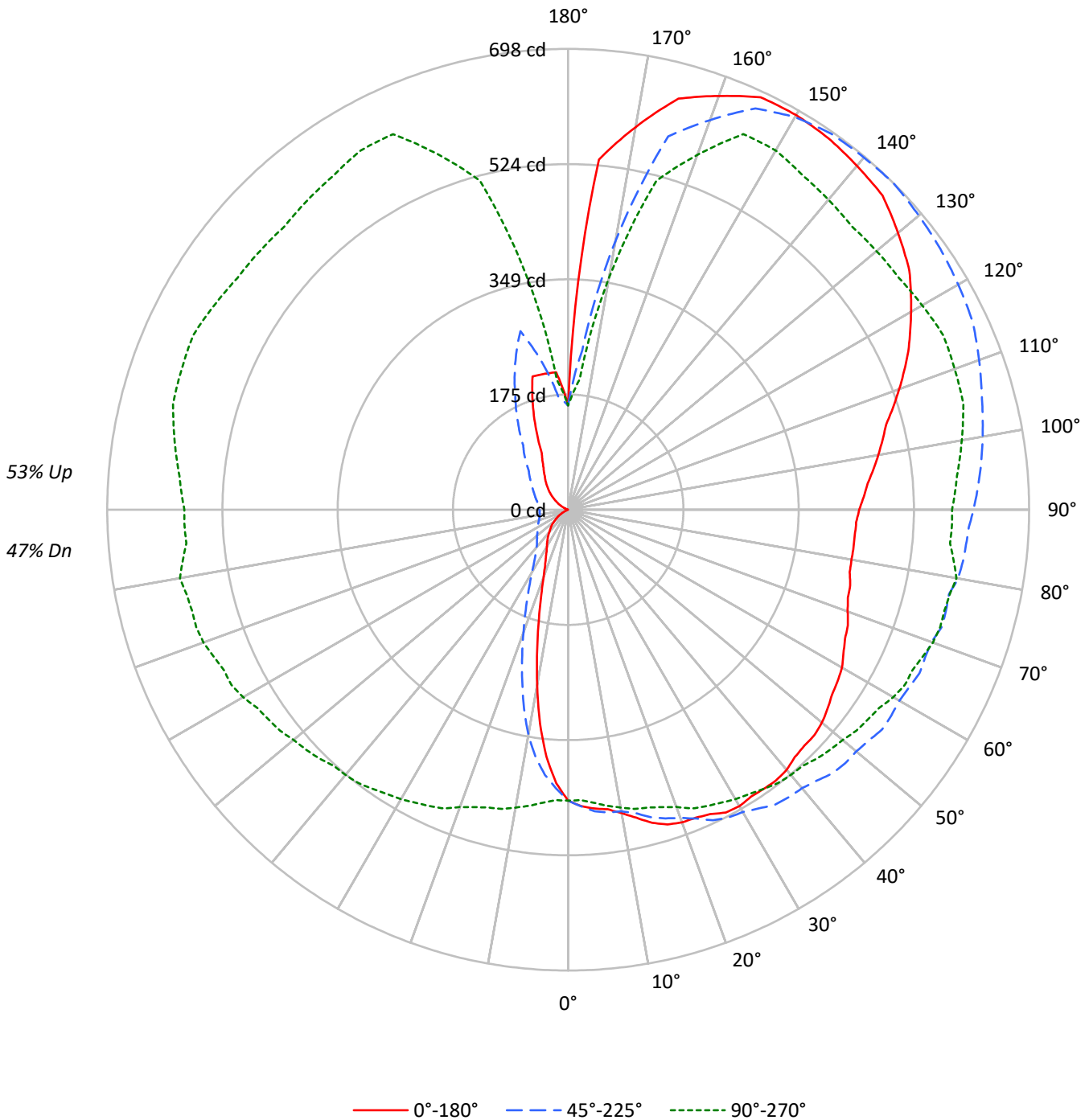
Summary

Lumens per Lamp: 6000 (1 lamp)
Luminaire Lumens: 4651.2 lumens
Efficiency: 77.5%
Efficacy: 66.4 lumens/watt
Spacing Criteria (0/90/45): 0.92 / 1.77 / 1.44
Luminous Opening: Point Source (0' x 0' x 0')
CIE Type: General Diffuse

Input Watts (W): 70
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	82	82	82	82	76	76	76	76	63	63	63	52	52	52	41	41	41	36
1	72	68	63	60	66	62	58	55	51	48	46	41	39	37	32	30	29	24
2	65	58	52	47	59	53	47	43	43	39	36	34	31	29	26	24	22	18
3	58	50	43	38	53	45	39	35	37	33	29	30	26	23	23	20	18	14
4	53	43	36	31	48	40	34	29	33	28	24	26	22	19	20	17	15	12
5	48	38	31	26	44	35	29	24	29	24	20	23	19	16	18	15	12	10
6	44	34	27	22	40	31	25	21	26	21	17	21	17	14	16	13	11	8
7	41	31	24	19	37	28	22	18	23	18	15	19	15	12	14	11	9	7
8	38	28	21	17	34	25	20	16	21	16	13	17	13	11	13	10	8	6
9	35	25	19	15	32	23	18	14	19	15	12	16	12	9	12	9	7	6
10	33	23	17	13	30	21	16	12	18	13	10	14	11	8	11	9	7	5

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	Luminaire represents a point source (luminous area is zero).		
5°	No luminance values can be calculated.		
10°			
15°			
20°			
25°			
30°			
35°			
40°			
45°			
50°			
55°			
60°			
65°			
70°			
75°			
80°			
85°			



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ZONAL LUMENS:

CANDELA DISTRIBUTION:

Zone	Lumens	% Fixture	% Lamp		0°	45°	90°	135°	180°	Flux
0°-10°	40.5	0.9	0.7	0°	441	441	441	441	441	
10°-20°	109.8	2.4	1.8	5°	454	458	446	403	376	44
20°-30°	167.3	3.6	2.8	15°	491	482	467	269	171	139
30°-40°	220.4	4.7	3.7	25°	509	519	496	145	80	237
40°-50°	267.2	5.7	4.5	35°	516	546	516	87	54	324
50°-60°	306.6	6.6	5.1	45°	506	565	533	67	37	392
60°-70°	336.2	7.2	5.6	55°	488	580	554	57	20	439
70°-80°	356.2	7.7	5.9	65°	462	587	575	50	6	460
80°-90°	368.1	7.9	6.1	75°	442	592	590	45	0	467
90°-100°	378.8	8.1	6.3	85°	436	605	580	44	0	356
100°-110°	387.1	8.3	6.5	90°	441	614	581	44	0	242
110°-120°	382.8	8.2	6.4	95°	455	626	591	44	0	378
120°-130°	362.6	7.8	6.0	105°	498	649	619	49	0	534
130°-140°	327.3	7.0	5.5	115°	568	676	626	56	7	562
140°-150°	278.9	6.0	4.6	125°	631	688	612	67	23	561
150°-160°	214.3	4.6	3.6	135°	673	698	607	84	42	516
160°-170°	115.7	2.5	1.9	145°	687	695	619	119	62	430
170°-180°	24.5	0.5	0.4	155°	689	671	628	189	94	317
0°-30°	317.6	6.8	5.3	165°	645	585	516	280	209	178
0°-40°	538.0	11.6	9.0	175°	532	242	198	172	209	36
0°-60°	1111.8	23.9	18.5	180°	158	158	158	158	158	
0°-90°	2172.3	46.7	36.2							
90°-120°	1148.7	24.7	19.1							
90°-150°	2117.5	45.5	35.3							
90°-180°	2472.0	53.1	41.2							
0°-180°	4651.2	100.0	77.5							



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CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6
2.5°	449.5	452.4	451.6	447.1	450.8	449.9	445.9	450.3	447.5	443.0	440.2
5°	454.4	456.8	458.5	454.8	456.4	458.5	455.2	456.4	453.2	450.8	445.5
7.5°	457.7	464.6	465.0	463.8	461.3	462.5	462.9	464.2	461.3	458.1	452.4
10°	466.6	477.2	474.7	471.1	467.4	463.8	467.0	470.3	467.4	463.4	458.1
12.5°	478.0	487.3	485.7	478.4	476.8	470.7	472.7	476.8	472.7	468.6	464.2
15°	491.0	493.8	493.4	488.6	486.5	482.0	478.0	481.6	480.4	473.9	467.0
17.5°	499.9	501.2	502.0	500.3	495.9	490.2	484.9	484.5	488.6	481.2	472.3
20°	504.0	512.5	510.9	508.9	506.0	496.7	491.4	492.2	494.6	491.4	479.2
22.5°	504.8	517.4	518.2	513.3	513.3	506.4	499.9	499.9	497.9	499.5	489.8
25°	508.9	517.0	521.5	519.8	520.7	519.0	509.3	503.6	501.6	503.2	495.5
27.5°	517.0	518.2	522.3	524.3	527.2	525.5	518.2	507.7	508.9	508.1	500.3
30°	518.6	522.7	524.7	527.6	531.6	528.8	527.2	514.2	517.0	518.6	506.4
32.5°	515.4	527.2	528.8	530.0	536.1	536.5	534.5	523.9	520.3	526.8	510.5
35°	516.2	525.1	529.2	532.0	540.2	545.5	542.6	534.1	524.3	528.0	516.2
37.5°	517.0	520.3	525.5	532.4	543.4	548.7	551.1	541.8	528.4	532.4	521.9
40°	514.6	519.8	526.8	536.1	546.3	550.7	557.2	548.7	532.0	542.2	524.3
42.5°	508.1	519.0	526.8	538.1	548.7	556.8	562.5	557.2	537.7	544.2	525.9
45°	505.6	514.6	521.1	534.5	552.0	565.0	571.9	567.0	543.8	546.3	532.9
47.5°	505.6	511.7	518.2	531.6	554.4	568.6	578.8	573.1	548.7	556.0	538.1
50°	501.6	508.1	518.6	533.7	555.6	569.4	582.8	578.0	553.6	561.7	542.6
52.5°	495.1	501.6	513.3	531.6	552.8	573.9	588.9	588.1	560.5	562.9	549.9
55°	487.7	496.7	507.2	526.4	554.0	580.4	593.8	597.5	566.2	569.8	554.0
57.5°	483.7	493.4	503.6	525.1	556.8	580.0	596.3	599.1	571.9	579.6	558.5
60°	478.8	485.3	501.2	524.7	553.6	578.8	601.5	606.0	578.0	584.1	568.2
62.5°	469.9	477.2	494.6	519.8	550.3	582.0	607.2	615.8	584.5	586.1	574.7
65°	462.5	472.3	486.9	515.8	553.6	586.9	608.9	617.8	590.2	593.4	575.1
67.5°	458.5	466.2	482.9	514.2	554.4	584.9	611.3	621.5	596.3	603.2	581.2
70°	450.3	458.9	478.4	510.5	549.5	585.3	619.0	632.0	601.5	606.8	587.7
72.5°	443.8	453.2	472.7	506.0	550.7	592.6	622.3	633.2	606.4	605.6	590.6
75°	442.2	448.3	469.0	506.4	554.8	592.2	620.2	635.7	610.5	609.7	589.8
77.5°	436.5	446.3	467.0	506.4	554.0	590.6	627.2	641.8	612.1	616.6	591.8
80°	435.7	444.2	464.6	504.4	555.6	599.5	632.4	643.8	617.0	613.3	597.1
82.5°	435.7	442.6	464.2	503.6	558.5	602.8	633.2	647.1	620.6	605.6	588.5
85°	435.7	443.4	465.0	507.7	562.9	604.8	636.9	650.3	620.6	602.0	580.4
87.5°	436.5	446.7	469.0	512.5	567.8	607.2	641.0	651.5	621.5	602.4	581.6
90°	440.6	449.9	473.5	516.2	569.4	613.7	646.7	655.2	625.9	599.9	581.2
95°	455.2	462.1	484.5	532.0	589.4	625.9	651.1	663.7	631.2	608.9	591.0
105°	498.3	506.8	531.2	575.9	621.9	648.7	669.8	675.9	641.4	638.9	619.4
115°	568.2	575.1	593.8	627.6	658.0	675.5	683.6	681.2	643.4	649.5	626.3
125°	630.8	640.6	649.9	666.6	681.2	688.1	695.4	679.2	639.3	638.9	611.7
135°	673.1	679.2	681.6	691.0	699.1	697.9	695.4	670.6	641.0	637.7	607.2
145°	686.9	695.4	696.2	698.7	702.3	695.0	682.0	655.2	652.4	645.8	618.6
150°	690.2	701.5	703.6	699.9	693.8	686.5	672.7	653.2	656.0	653.6	628.4
155°	689.3	693.0	691.0	691.8	686.9	670.6	657.6	651.9	659.7	647.5	627.6



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CANDELA DISTRIBUTION (continued):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
165°	644.6	643.8	632.4	618.6	603.2	585.3	574.3	566.6	556.4	532.9	515.8
175°	532.4	484.5	450.3	479.6	352.0	242.2	269.5	181.3	196.3	243.5	197.9
180°	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7



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CANDELA DISTRIBUTION (continued):

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6	440.6
2.5°	441.4	438.6	431.2	428.8	422.3	418.2	416.6	415.0	411.7	414.6
5°	443.4	436.5	426.0	415.8	403.2	394.3	385.7	380.0	375.6	375.6
7.5°	445.9	433.3	419.0	397.1	378.0	360.1	344.7	332.5	328.0	326.8
10°	449.5	430.8	407.7	375.6	345.9	317.8	295.5	278.8	272.3	269.9
12.5°	454.0	428.4	392.6	350.4	308.9	271.1	244.7	226.0	217.9	217.0
15°	458.9	425.6	375.2	321.5	268.7	227.2	199.2	180.5	171.5	170.7
17.5°	462.9	420.7	357.3	291.0	231.3	188.6	161.0	143.5	135.8	134.9
20°	466.2	413.8	338.6	260.1	197.9	156.9	130.9	115.8	109.7	108.9
22.5°	469.9	406.4	318.2	231.3	169.1	130.1	108.9	96.7	91.9	91.0
25°	476.8	399.5	295.1	204.4	144.7	110.1	92.3	82.9	79.7	79.7
27.5°	478.4	390.6	273.1	180.9	125.2	95.5	81.7	74.0	71.1	70.7
30°	478.4	378.4	252.4	160.1	109.3	84.5	74.0	67.5	65.0	64.2
32.5°	482.9	369.1	233.3	142.7	96.7	76.8	67.5	62.2	60.2	59.3
35°	486.9	358.9	214.2	127.6	87.4	70.7	63.0	57.7	54.9	54.5
37.5°	484.5	344.7	196.3	114.2	79.7	65.4	57.7	52.0	49.6	49.6
40°	484.1	332.5	181.3	104.1	74.4	61.4	53.7	47.6	45.1	44.7
42.5°	486.5	321.5	167.5	95.9	69.9	57.3	49.2	43.5	40.6	39.8
45°	490.2	311.3	156.1	90.2	67.1	54.9	46.3	40.2	36.6	36.6
47.5°	490.2	300.4	145.9	85.4	63.8	51.6	42.7	36.2	32.5	32.5
50°	490.6	291.8	137.8	81.3	61.8	48.8	39.4	32.1	28.5	27.6
52.5°	494.2	284.5	130.9	78.0	58.9	45.5	35.8	28.5	24.4	23.6
55°	498.7	277.2	124.0	76.0	56.9	43.1	32.5	24.8	20.3	20.3
57.5°	500.7	269.9	119.1	74.0	55.3	41.1	29.3	21.1	16.7	16.3
60°	503.2	263.4	114.6	71.9	52.8	38.2	26.4	17.9	13.0	12.2
62.5°	505.2	256.9	111.0	69.9	51.2	35.8	24.0	14.6	9.3	8.9
65°	505.2	252.4	107.3	69.1	50.0	34.1	21.1	11.4	6.1	5.7
67.5°	507.7	246.3	104.9	67.9	48.4	32.5	18.7	8.5	3.3	2.4
70°	510.5	241.4	102.8	66.7	47.1	30.1	16.7	6.1	0.8	0.0
72.5°	507.2	237.8	100.8	66.3	45.9	28.9	14.6	3.7	0.0	0.0
75°	506.4	233.3	99.2	65.8	45.1	27.6	12.6	2.0	0.0	0.0
77.5°	506.0	229.2	98.4	65.4	44.3	26.4	11.0	0.4	0.0	0.0
80°	501.2	226.4	97.5	65.0	43.9	25.6	10.2	0.0	0.0	0.0
82.5°	499.5	223.5	96.7	64.6	43.5	24.8	8.5	0.0	0.0	0.0
85°	495.1	221.9	97.1	64.6	43.5	24.4	8.1	0.0	0.0	0.0
87.5°	490.2	221.5	97.5	65.0	43.1	24.4	7.7	0.0	0.0	0.0
90°	491.4	221.9	98.0	65.4	43.9	24.4	7.7	0.0	0.0	0.0
95°	501.6	226.4	100.0	66.7	44.3	25.2	8.5	0.0	0.0	0.0
105°	528.8	245.1	107.7	70.3	48.8	30.1	15.0	3.7	0.0	0.0
115°	538.1	271.5	122.7	78.0	56.5	39.8	26.0	14.6	8.1	7.3
125°	534.5	302.8	148.4	90.2	67.1	51.6	38.6	27.6	23.2	22.8
135°	541.8	348.7	193.9	115.4	84.5	68.7	54.9	45.9	41.5	41.5
145°	569.8	416.6	270.7	171.9	118.7	91.9	74.0	65.4	62.2	61.8
150°	582.4	454.0	321.1	217.5	151.6	108.5	88.6	78.9	75.6	74.8
155°	595.4	491.0	375.2	271.1	189.4	140.6	116.2	102.0	94.3	94.3



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CANDELA DISTRIBUTION (continued):

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
165°	497.5	444.7	384.5	326.8	280.0	248.7	226.4	212.2	206.9	208.9
175°	203.2	204.9	245.5	247.9	171.9	156.1	173.6	176.4	206.9	208.9
180°	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7	157.7

(END OF REPORT)