

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: ITL50719

Luminaire Tested: **FMW-2/228T5-80/86**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: ITL50719
Test Lab:
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: FMW-2/228T5-80/86
Description: FABRICATED METAL HOUSING WITH WHITE PAINTED GENERAL INTERIOR FINISH, FORMED WHITE PAINTED METAL REFLECTOR, TWO 1/4" CLEAR FLAT POLYCARBONATE LENSES WITH 1/8" CLEAR ACRYLIC PRISMATIC OVERLAYS.
Light Source: FOUR 28-WATT T-5 FP28/835 LINEAR FLUORESCENTS.
Ballast/Driver: TWO MAGNETEK BT5-228/120, L.O.B.F = 97.25%

Summary

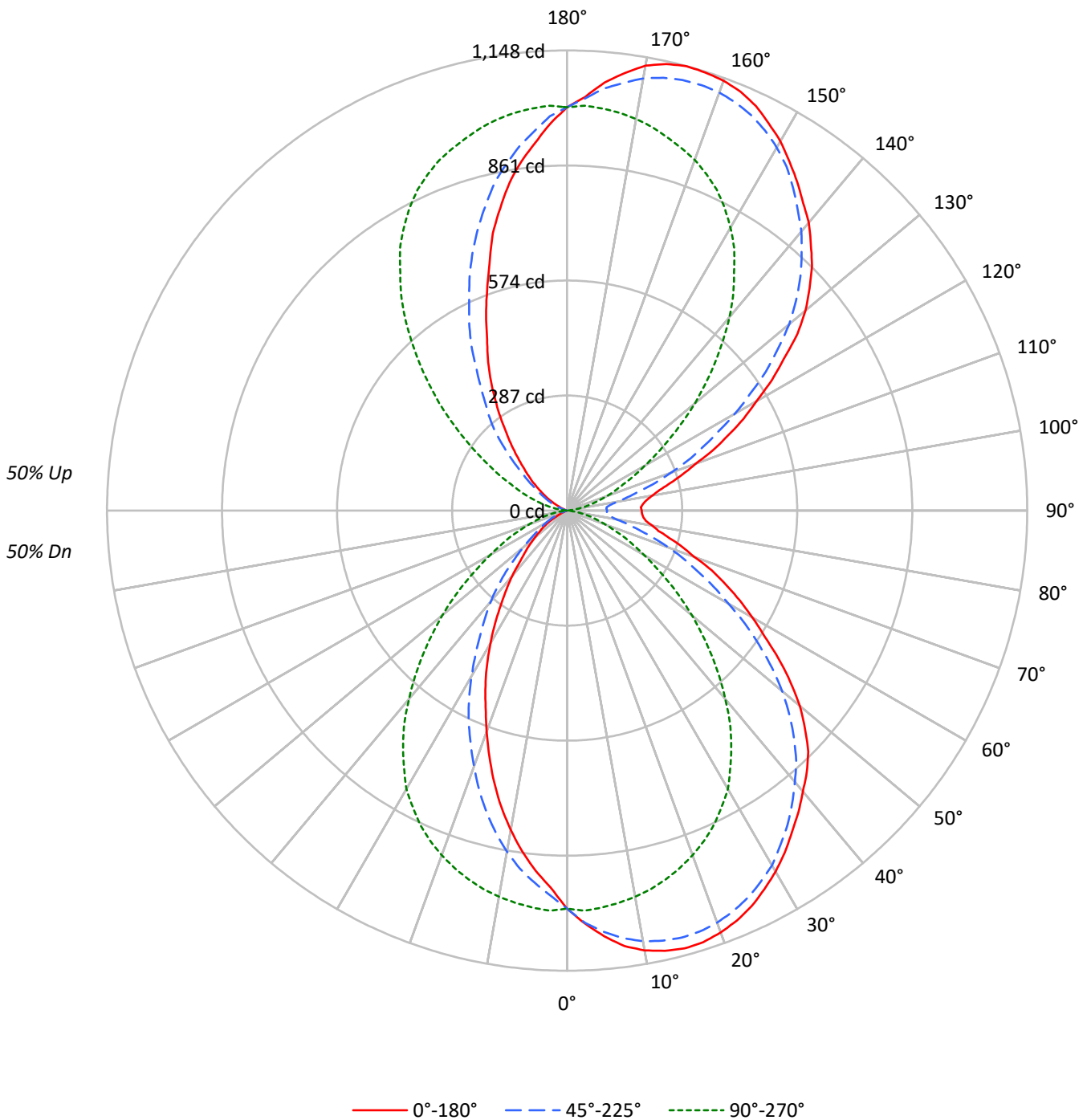
Lumens per Lamp: 2900 (4 lamps)
Luminaire Lumens: 4477.8 lumens
Efficiency: 38.6%
Efficacy: 38.3 lumens/watt
Spacing Criteria (0/90/45): 1.09 / 1.2 / 1.24
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 0.28' x H: 0.64')
CIE Type: General Diffuse

Input Watts (W): 116.8
Input Voltage (V): NR
Input Current (A_{in}): 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										
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	50	30	10	0														
RCR																																						
0	41	41	41	41	38	38	38	38	32	32	32	27	27	27	21	21	21	19	19	19	19	19	19	19														
1	38	36	35	33	35	33	32	31	28	27	26	23	23	22	19	19	18	16	16	16	16	16	16	16														
2	35	32	29	27	32	29	27	26	25	23	22	21	20	19	17	16	16	14	14	14	14	14	14	14														
3	32	28	25	23	29	26	24	22	22	20	19	19	17	16	15	14	13	12	12	12	12	12	12	12														
4	29	25	22	20	27	23	21	18	20	18	16	17	15	14	14	13	12	10	10	10	10	10	10	10														
5	27	22	19	17	25	21	18	16	18	16	14	15	13	12	12	11	10	9	9	9	9	9	9	9														
6	25	20	17	15	23	19	16	14	16	14	12	14	12	11	11	10	9	8	8	8	8	8	8	8														
7	23	18	15	13	21	17	14	12	15	12	11	12	11	10	10	9	8	7	7	7	7	7	7	7														
8	21	17	14	12	20	15	13	11	13	11	10	11	10	9	10	8	7	6	6	6	6	6	6	6														
9	20	15	12	10	18	14	12	10	12	10	9	11	9	8	9	8	7	6	6	6	6	6	6	6														
10	18	14	11	9	17	13	11	9	11	9	8	10	8	7	8	7	6	5	5	5	5	5	5	5														

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	9888	9888	9888
5°	8869	9796	7504
10°	8011	9613	5818
15°	7211	9405	4482
20°	6457	9155	3384
25°	5770	8845	2554
30°	5134	8431	1891
35°	4551	7794	1345
40°	4057	7025	949
45°	3629	6167	640
50°	3137	5270	439
55°	2607	4327	296
60°	2132	3451	156
65°	1734	2744	60
70°	1339	2034	0
75°	1059	1510	0
80°	877	896	0
85°	799	160	0



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ZONAL LUMENS:

CANDELA DISTRIBUTION:

Zone	Lumens	% Fixture	% Lamp		0°	45°	90°	135°	180°	Flux
0°-10°	94.0	2.1	0.8	0°	993	993	993	993	993	
10°-20°	263.9	5.9	2.3	5°	1066	1055	994	932	902	103
20°-30°	379.7	8.5	3.3	15°	1131	1103	952	778	703	319
30°-40°	422.5	9.4	3.6	25°	1089	1066	866	581	482	501
40°-50°	393.8	8.8	3.4	35°	978	958	714	377	289	613
50°-60°	303.8	6.8	2.6	45°	851	800	509	216	150	652
60°-70°	194.8	4.3	1.7	55°	644	585	307	92	73	576
70°-80°	105.5	2.4	0.9	65°	437	360	157	36	15	433
80°-90°	59.1	1.3	0.5	75°	264	184	63	0	0	284
90°-100°	59.1	1.3	0.5	85°	191	99	4	0	0	161
100°-110°	107.1	2.4	0.9	90°	186	100	0	0	0	102
110°-120°	199.7	4.5	1.7	95°	190	99	5	0	0	161
120°-130°	312.7	7.0	2.7	105°	267	187	64	0	0	286
130°-140°	404.1	9.0	3.5	115°	442	372	154	39	17	439
140°-150°	430.2	9.6	3.7	125°	660	605	312	98	74	592
150°-160°	385.3	8.6	3.3	135°	864	823	522	222	157	665
160°-170°	267.3	6.0	2.3	145°	1001	983	726	375	295	627
170°-180°	95.1	2.1	0.8	155°	1114	1088	883	578	472	512
0°-30°	737.7	16.5	6.4	165°	1148	1112	964	787	716	324
0°-40°	1160.2	25.9	10.0	175°	1072	1057	1007	949	920	104
0°-60°	1857.8	41.5	16.0	180°	1006	1006	1006	1006	1006	
0°-90°	2217.2	49.5	19.1							
90°-120°	365.8	8.2	3.2							
90°-150°	1512.8	33.8	13.0							
90°-180°	2261.0	50.5	19.5							
0°-180°	4477.8	100.0	38.6							



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°
0°	993	993	993	993	993	993	993	993	993
2.5°	1032	1027	1030	1013	999	983	961	950	941
5°	1066	1059	1055	1025	994	964	932	911	902
7.5°	1096	1085	1076	1034	987	944	901	874	858
10°	1114	1106	1091	1040	978	921	864	830	809
12.5°	1125	1117	1099	1043	967	898	823	776	758
15°	1131	1121	1103	1043	952	867	778	726	703
17.5°	1129	1119	1101	1039	935	834	730	673	644
20°	1120	1113	1094	1032	915	797	679	618	587
22.5°	1107	1100	1082	1020	892	758	629	560	531
25°	1089	1083	1066	1005	866	716	581	508	482
27.5°	1065	1062	1045	986	834	674	530	452	433
30°	1040	1036	1022	963	802	631	476	404	383
32.5°	1011	1006	990	936	758	577	425	361	334
35°	978	976	958	904	714	526	377	317	289
37.5°	948	943	922	866	667	476	335	280	249
40°	915	909	884	818	614	428	297	243	214
42.5°	885	874	846	770	562	383	256	206	176
45°	851	837	800	719	509	338	216	171	150
47.5°	805	797	752	663	456	295	177	142	127
50°	758	748	700	604	406	253	143	119	106
52.5°	702	698	644	541	356	211	115	99	88
55°	644	634	585	480	307	173	92	78	73
57.5°	584	577	527	423	261	136	73	61	56
60°	534	521	465	369	222	109	60	45	39
62.5°	485	468	412	319	187	89	48	32	25
65°	437	414	360	273	157	72	36	22	15
67.5°	391	367	314	231	126	59	24	13	10
70°	337	324	270	192	101	45	14	6	0
72.5°	301	284	224	158	80	31	8	0	0
75°	264	256	184	129	63	19	0	0	0
77.5°	233	224	152	103	45	10	0	0	0
80°	215	196	124	82	30	3	0	0	0
82.5°	198	176	107	63	16	0	0	0	0
85°	191	164	99	51	4	0	0	0	0
87.5°	187	159	99	41	0	0	0	0	0
90°	186	159	100	39	0	0	0	0	0
92.5°	184	158	98	41	0	0	0	0	0
95°	190	164	99	51	5	0	0	0	0
97.5°	200	176	108	63	15	0	0	0	0
100°	215	197	126	82	30	3	0	0	0
102.5°	236	224	154	104	47	9	0	0	0
105°	267	259	187	129	64	20	0	0	0
107.5°	303	288	231	159	82	34	9	0	0
110°	340	329	275	194	105	48	15	8	0



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°
112.5°	394	375	326	232	129	62	26	15	11
115°	442	424	372	277	154	77	39	23	17
117.5°	496	477	423	326	189	92	52	36	29
120°	545	536	484	372	224	114	65	50	43
122.5°	605	598	541	428	266	142	80	66	59
125°	660	658	605	488	312	174	98	82	74
127.5°	724	718	663	556	362	215	122	103	92
130°	776	771	723	623	416	254	149	126	113
132.5°	820	818	774	682	467	294	184	149	134
135°	864	862	823	737	522	338	222	180	157
137.5°	900	901	866	794	575	384	264	215	186
140°	938	938	909	839	630	429	300	249	219
142.5°	967	968	945	879	681	476	333	283	253
145°	1001	1000	983	918	726	531	375	319	295
147.5°	1032	1035	1018	953	776	585	422	358	337
150°	1064	1066	1046	980	815	632	479	404	384
152.5°	1089	1093	1069	1001	851	675	529	453	428
155°	1114	1113	1088	1020	883	720	578	504	472
157.5°	1131	1127	1101	1035	908	766	635	560	528
160°	1141	1138	1110	1045	931	807	688	618	584
162.5°	1146	1141	1113	1050	948	843	739	677	644
165°	1148	1140	1112	1053	964	878	787	740	716
167.5°	1141	1131	1106	1054	980	909	837	793	772
170°	1127	1116	1095	1050	992	933	877	842	830
172.5°	1101	1092	1076	1043	1001	959	916	889	878
175°	1072	1063	1057	1034	1007	982	949	931	920
177.5°	1033	1031	1029	1022	1011	1000	985	973	966
180°	1006	1006	1006	1006	1006	1006	1006	1006	1006

(END OF REPORT)