

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: 168P131

Luminaire Tested: **CFST5-12-228-120-1K12**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: 168P131  
Test Lab:  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: CFST5-12-228-120-1K12  
Description: 1 X 4 FAIL-SAFE CFS SERIES  
WITH A PRISMATIC ACRYLIC LENS  
Light Source: TWO - F28T5/835 - 2900 LUMENS EA. - 28 WATTS EA.  
Ballast/Driver: ENERGY SAVINGS ES-2-T5-28-120-F ELECTRONIC  
L.O.B.F. = 92.6%

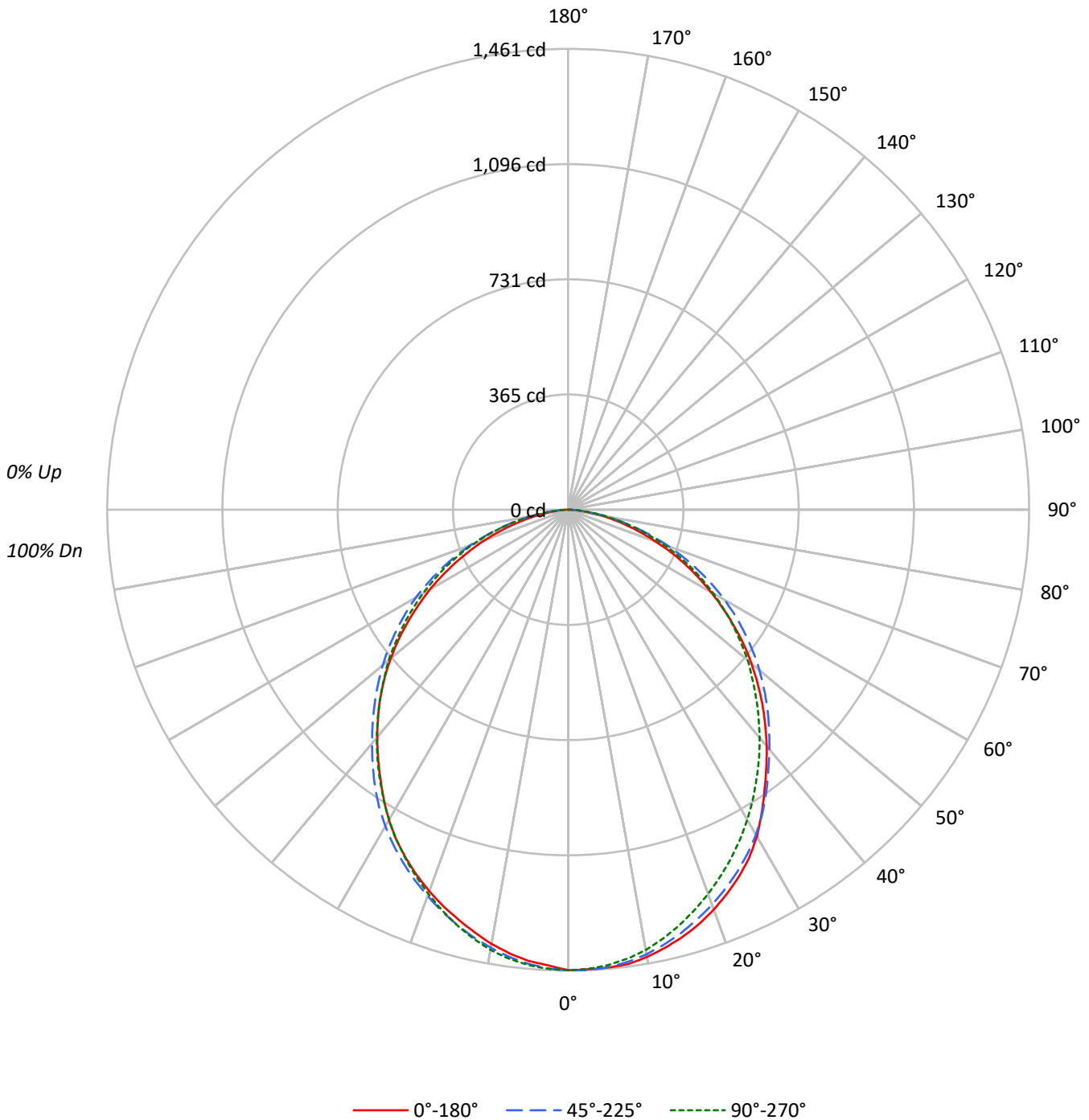
**Summary**

Lumens per Lamp: 2900 (2 lamps)  
Luminaire Lumens: 3717.4 lumens  
Efficiency: 64.1%  
Efficacy: 63.0 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.16 / 1.31  
Luminous Opening: Rectangular (W 3.65' x L: 0.65' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 59  
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	76	76	76	76	75	75	75	75	71	71	71	68	68	68	65	65	65	64
1	70	67	64	62	68	66	63	61	63	61	59	60	59	57	58	57	56	54
2	64	59	54	51	62	57	54	50	55	52	49	53	50	48	51	49	47	46
3	58	52	47	43	57	51	46	42	49	45	41	47	44	41	45	42	40	39
4	53	46	40	36	52	45	40	36	43	39	35	42	38	35	41	37	35	33
5	49	41	35	31	48	40	35	31	39	34	31	38	34	30	37	33	30	29
6	46	37	31	27	44	37	31	27	35	31	27	34	30	27	33	30	27	25
7	42	34	28	24	41	33	28	24	32	27	24	31	27	24	30	27	24	22
8	39	31	25	22	38	30	25	22	30	25	22	29	25	21	28	24	21	20
9	37	28	23	20	36	28	23	20	27	23	19	27	22	19	26	22	19	18
10	35	26	21	18	34	26	21	18	25	21	18	25	21	18	24	20	18	16

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

	0°	90°	180°
0°	6624	6624	6624
5°	6636	6599	6540
10°	6634	6528	6441
15°	6585	6402	6317
20°	6513	6257	6214
25°	6418	6107	6097
30°	6266	5946	5951
35°	6009	5766	5749
40°	5798	5591	5573
45°	5582	5402	5402
50°	5350	5244	5181
55°	5070	5031	4904
60°	4746	4827	4591
65°	4391	4584	4176
70°	3913	4258	3701
75°	3401	3821	3103
80°	2743	3188	2378
85°	2082	2343	1770



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

Zone	Lumens	% Fixture	% Lamp		0°	45°	90°	135°	180°	Flux
0°-10°	137.5	3.7	2.4	0°	1460	1460	1460	1460	1460	
10°-20°	386.9	10.4	6.7	5°	1457	1456	1449	1445	1436	139
20°-30°	572.7	15.4	9.9	15°	1402	1388	1363	1362	1345	395
30°-40°	666.4	17.9	11.5	25°	1282	1267	1220	1236	1218	590
40°-50°	666.7	17.9	11.5	35°	1085	1094	1041	1068	1038	680
50°-60°	583.3	15.7	10.1	45°	870	893	842	867	842	671
60°-70°	425.8	11.5	7.3	55°	641	684	636	663	620	573
70°-80°	225.2	6.1	3.9	65°	409	455	427	444	389	404
80°-90°	52.9	1.4	0.9	75°	194	224	218	220	177	207
90°-100°	0.0	0.0	0.0	85°	40	43	45	44	34	46
100°-110°	0.0	0.0	0.0	90°	0	0	0	0	0	3
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°	1097.0	29.5	18.9	165°	0	0	0	0	0	0
0°-40°	1763.4	47.4	30.4	175°	0	0	0	0	0	0
0°-60°	3013.4	81.1	52.0	180°	0	0	0	0	0	0
0°-90°	3717.4	100.0	64.1							
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°	3717.4	100.0	64.1							



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°
0°	1460	1460	1460	1460	1460	1460	1460	1460	1460
2.5°	1458	1464	1461	1457	1457	1455	1456	1457	1446
5°	1457	1461	1456	1450	1449	1445	1445	1447	1436
7.5°	1453	1453	1446	1438	1436	1430	1430	1432	1419
10°	1440	1438	1431	1421	1417	1411	1410	1412	1398
12.5°	1422	1420	1411	1398	1392	1387	1388	1389	1372
15°	1402	1399	1388	1371	1363	1360	1362	1363	1345
17.5°	1378	1374	1361	1341	1331	1329	1334	1335	1318
20°	1349	1346	1333	1309	1296	1296	1303	1304	1287
22.5°	1317	1313	1301	1275	1259	1262	1271	1272	1254
25°	1282	1278	1267	1239	1220	1225	1236	1237	1218
27.5°	1243	1238	1230	1200	1179	1185	1199	1198	1180
30°	1196	1192	1190	1157	1135	1143	1159	1156	1136
32.5°	1141	1139	1144	1111	1089	1097	1116	1110	1088
35°	1085	1084	1094	1063	1041	1050	1068	1059	1038
37.5°	1031	1032	1042	1014	993	1002	1018	1009	990
40°	979	980	992	965	944	954	967	959	941
42.5°	924	928	942	915	893	905	917	910	892
45°	870	875	893	865	842	855	867	861	842
47.5°	814	821	842	815	791	804	817	810	789
50°	758	766	791	764	743	752	767	758	734
52.5°	701	711	738	711	688	700	716	703	678
55°	641	653	684	659	636	648	663	647	620
57.5°	581	595	629	606	584	594	611	591	562
60°	523	537	572	552	532	542	557	534	506
62.5°	465	479	515	498	479	488	500	477	447
65°	409	422	455	444	427	435	444	419	389
67.5°	352	364	396	388	373	380	387	361	333
70°	295	308	337	334	321	327	330	304	279
72.5°	243	252	280	279	269	274	274	250	227
75°	194	200	224	225	218	221	220	199	177
77.5°	147	151	170	174	168	172	168	151	132
80°	105	107	122	125	122	125	121	107	91
82.5°	69	69	79	82	80	83	79	69	59
85°	40	38	43	46	45	48	44	40	34
87.5°	19	17	18	19	18	20	19	18	15
90°	0	0	0	0	0	0	0	0	0
92.5°	0	0	0	0	0	0	0	0	0
95°	0	0	0	0	0	0	0	0	0
97.5°	0	0	0	0	0	0	0	0	0
100°	0	0	0	0	0	0	0	0	0
102.5°	0	0	0	0	0	0	0	0	0
105°	0	0	0	0	0	0	0	0	0
107.5°	0	0	0	0	0	0	0	0	0
110°	0	0	0	0	0	0	0	0	0



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**CANDELA DISTRIBUTION (continued):**

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

(END OF REPORT)