

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: 240p103

Luminaire Tested: **HDF-232-S-UNV-EB81**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: 240p103  
Test Lab: METALUX RESEARCH LABORATORIES  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: HDF-232-S-UNV-EB81  
Description: HD PRO 2 LAMP T8 HO LAMP W/ SPECULAR REFLECTOR  
Light Source: TWO - F032 /830 - 3100 LUMENS - 32 WATTS  
Ballast/Driver: -

**Summary**

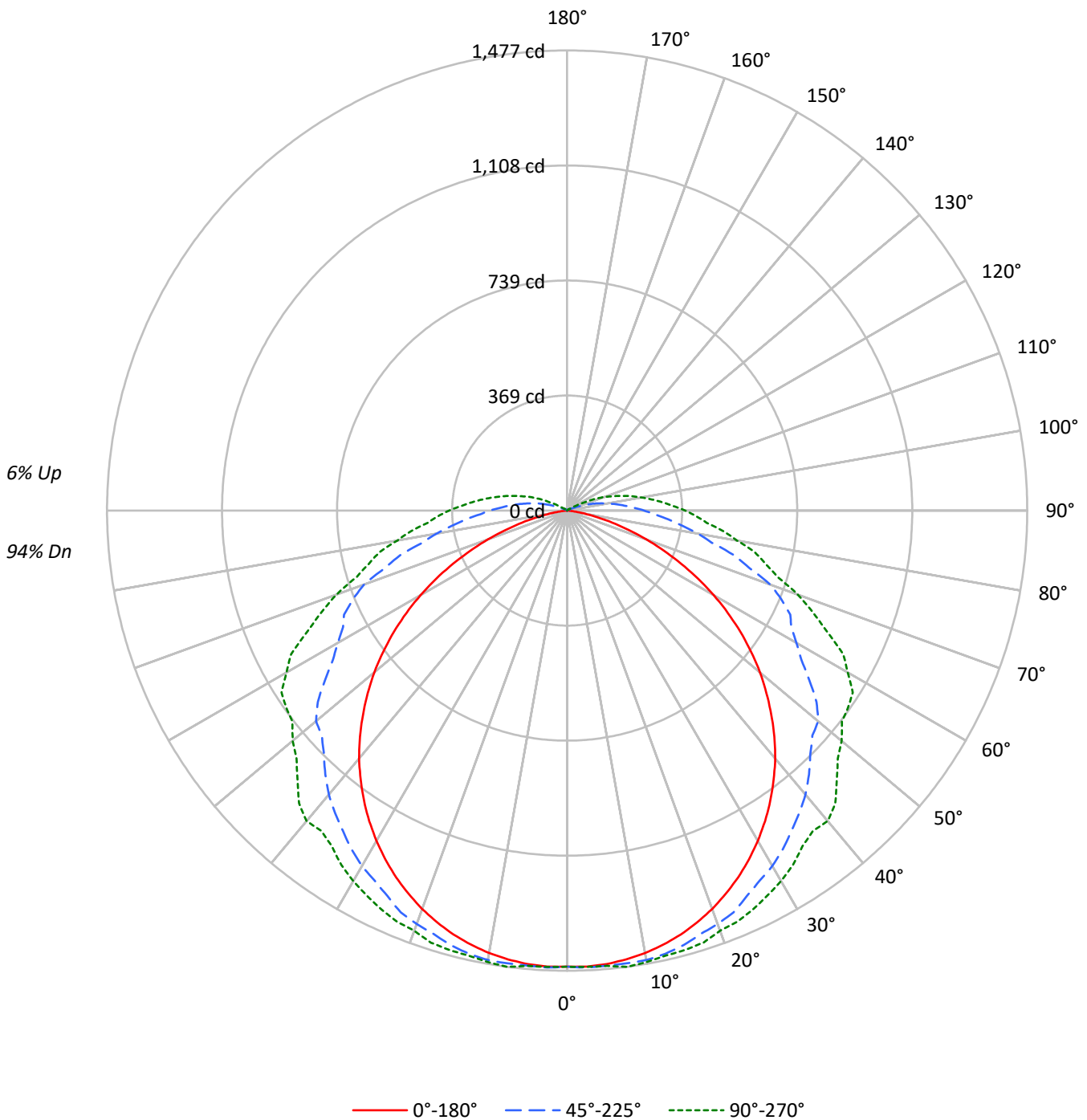
Lumens per Lamp: 3100 (2 lamps)  
Luminaire Lumens: 5496.6 lumens  
Efficiency: 88.7%  
Efficacy: 103.7 lumens/watt  
Spacing Criteria (0/90/45): 1.24 / 1.39 / 1.47  
Luminous Opening: Rectangular (W 0.46' x L: 4.04' x H: 0')  
CIE Type: Direct

Input Watts (W): 53  
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	104	104	104	104	101	101	101	101	96	96	96	91	91	91	86	86	86	84
1	93	88	84	80	90	86	82	78	81	77	74	76	74	71	72	70	68	66
2	84	76	69	63	81	74	67	62	70	64	60	66	61	58	62	59	56	53
3	76	66	58	52	73	64	57	51	61	54	49	57	52	48	54	50	46	44
4	69	58	49	43	67	56	49	42	53	47	41	51	45	40	48	43	39	37
5	64	51	43	37	61	50	42	36	48	41	35	45	39	34	43	38	34	32
6	59	46	38	32	56	45	37	31	43	36	31	41	35	30	39	34	29	27
7	54	42	33	28	52	41	33	28	39	32	27	37	31	26	35	30	26	24
8	50	38	30	25	49	37	30	24	35	29	24	34	28	23	32	27	23	21
9	47	35	27	22	45	34	27	22	33	26	21	31	25	21	30	25	21	19
10	44	32	25	20	43	31	24	20	30	24	19	29	23	19	28	23	19	17

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

	0°	45°	90°
0°	8507	8507	8507
5°	8522	8551	8557
10°	8508	8644	8679
15°	8476	8687	8783
20°	8416	8731	8873
25°	8328	8752	9053
30°	8213	8837	9212
35°	8065	8902	9335
40°	7881	9027	9869
45°	7618	9072	10058
50°	7304	9510	10396
55°	6879	9614	11154
60°	6310	9878	12086
65°	5555	10862	12649
70°	4604	11791	13388
75°	3368	12460	14795
80°	1941	14255	18538
85°	733	21735	30002



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

Zone	Lumens	% Fixture	% Lamp		0°	22.5°	45°	67.5°	90°	Flux
0°-10°	139.9	2.5	2.3	0°	1464	1464	1464	1464	1464	
10°-20°	406.8	7.4	6.6	5°	1461	1467	1466	1472	1467	139
20°-30°	629.0	11.4	10.1	15°	1409	1424	1444	1455	1460	397
30°-40°	779.9	14.2	12.6	25°	1299	1334	1365	1401	1412	598
40°-50°	848.0	15.4	13.7	35°	1137	1192	1255	1306	1316	711
50°-60°	825.2	15.0	13.3	45°	927	1003	1104	1213	1224	714
60°-70°	719.8	13.1	11.6	55°	679	795	949	1040	1101	606
70°-80°	515.9	9.4	8.3	65°	404	571	790	911	920	401
80°-90°	317.7	5.8	5.1	75°	150	359	555	626	659	164
90°-100°	184.6	3.4	3.0	85°	11	164	326	420	450	19
100°-110°	91.9	1.7	1.5	90°	1	97	247	346	379	1
110°-120°	28.0	0.5	0.5	95°	0	56	184	276	307	0
120°-130°	6.1	0.1	0.1	105°	1	9	86	155	181	1
130°-140°	3.5	0.1	0.1	115°	2	5	13	50	69	2
140°-150°	0.3	0.0	0.0	125°	2	3	8	9	8	2
150°-160°	0.0	0.0	0.0	135°	2	3	5	7	6	2
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°	1175.7	21.4	19.0	165°	0	0	0	0	0	0
0°-40°	1955.7	35.6	31.5	175°	0	0	0	0	0	0
0°-60°	3628.8	66.0	58.5	180°	0	0	0	0	0	0
0°-90°	5182.2	94.3	83.6							
90°-120°	304.4	5.5	4.9							
90°-150°	314.4	5.7	5.1							
90°-180°	314.0	5.7	5.1							
0°-180°	5496.6	100.0	88.7							



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	1464	1464	1464	1464	1464
2.5°	1465	1465	1468	1471	1466
5°	1461	1467	1466	1472	1467
7.5°	1453	1459	1466	1474	1477
10°	1442	1450	1465	1474	1471
12.5°	1427	1439	1457	1465	1463
15°	1409	1424	1444	1455	1460
17.5°	1386	1410	1425	1450	1454
20°	1361	1391	1412	1430	1435
22.5°	1331	1362	1396	1414	1428
25°	1299	1334	1365	1401	1412
27.5°	1263	1301	1339	1380	1393
30°	1224	1263	1317	1360	1373
32.5°	1182	1227	1289	1336	1349
35°	1137	1192	1255	1306	1316
37.5°	1089	1150	1224	1270	1296
40°	1039	1099	1190	1249	1301
42.5°	984	1050	1149	1248	1274
45°	927	1003	1104	1213	1224
47.5°	868	956	1068	1160	1178
50°	808	905	1052	1112	1150
52.5°	744	851	1009	1082	1112
55°	679	795	949	1040	1101
57.5°	612	741	891	1030	1087
60°	543	680	850	1007	1040
62.5°	474	618	811	957	999
65°	404	571	790	911	920
67.5°	336	517	744	826	854
70°	271	456	694	766	788
72.5°	208	396	613	689	708
75°	150	359	555	626	659
77.5°	99	319	475	581	617
80°	58	263	426	525	554
82.5°	28	212	373	473	505
85°	11	164	326	420	450
87.5°	4	125	280	382	415
90°	1	97	247	346	379
92.5°	0	75	214	309	340
95°	0	56	184	276	307
97.5°	0	42	157	245	274
100°	0	26	131	215	242
102.5°	1	14	108	186	213
105°	1	9	86	155	181
107.5°	1	8	59	132	153
110°	1	7	38	105	127



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
112.5°	2	6	21	75	98
115°	2	5	13	50	69
117.5°	2	4	10	27	44
120°	2	4	9	15	22
122.5°	2	4	9	10	12
125°	2	3	8	9	8
127.5°	2	3	7	8	7
130°	2	3	6	8	7
132.5°	2	3	5	7	6
135°	2	3	5	7	6
137.5°	2	3	4	6	5
140°	2	3	4	5	4
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)