

Scaled data based on original data using  
LM-46-04 Photometric Testing of Indoor Luminaires Using High Intensity Discharge or  
Incandescent Filament Lamps (Reaffirmed 2012)

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: HALO

Report Number: E395438

Luminaire Tested: **H221-24**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-46-04  
Report Number: E395438  
Test Lab:  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: H221-24  
Description: HALO RECESSED FLUOR - RECTANGULAR FLUSH OPAQUE LENS  
Light Source: PL13, 900 LUMENS  
Ballast/Driver: -

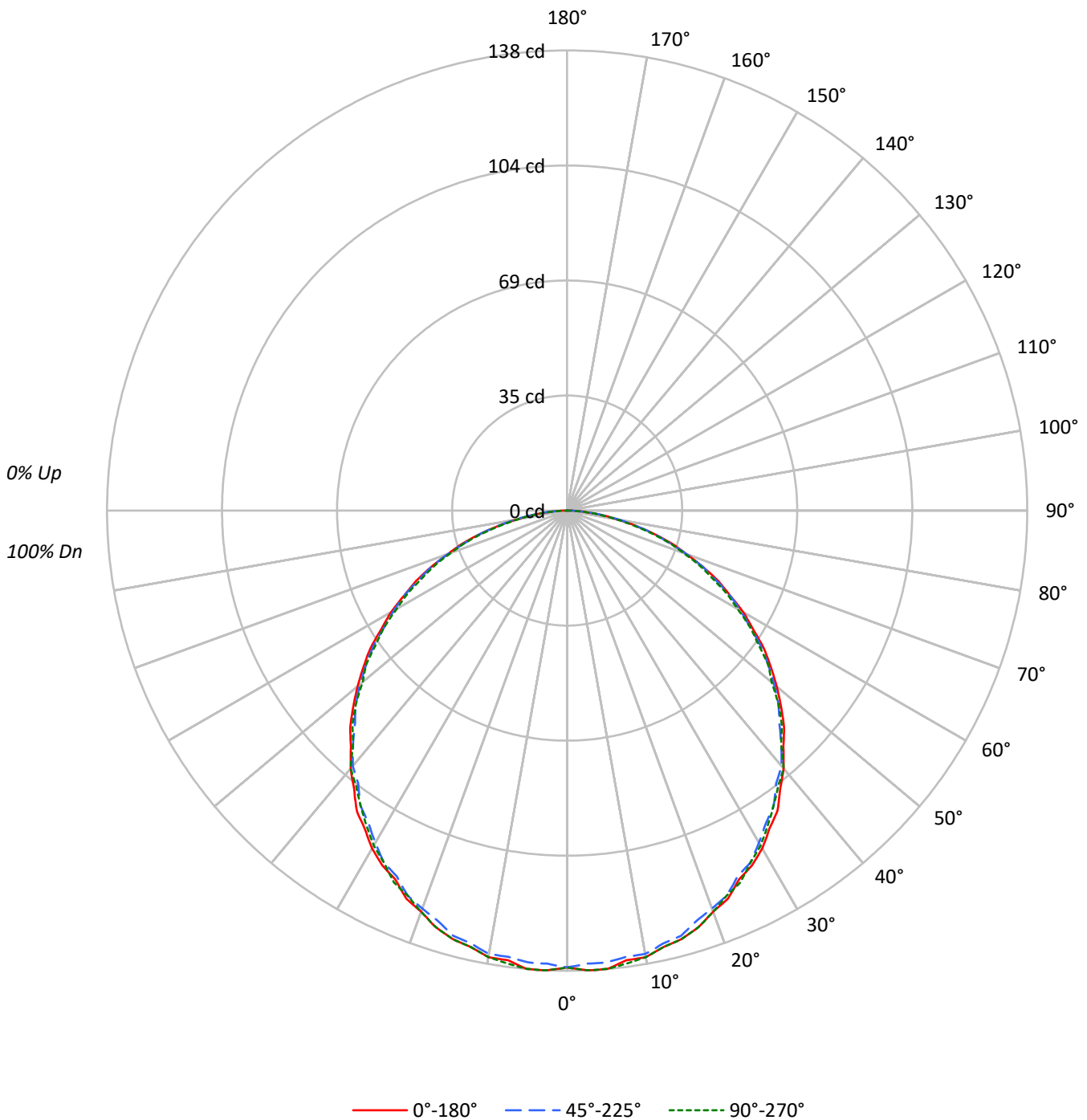
**Summary**

Lumens per Lamp: 900 (1 lamp)  
Luminaire Lumens: 390.4 lumens  
Efficiency: 43.4%  
Efficacy: 24.4 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.25 / 1.37  
Luminous Opening: Rectangular (W 0.61' x L: 0.28' x H: 0')  
CIE Type: Direct

Input Watts (W): 16  
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	52	52	52	52	50	50	50	50	48	48	48	46	46	46	44	44	44	43
1	47	45	43	41	46	44	42	41	42	41	39	40	39	38	39	38	37	36
2	43	39	36	34	42	38	36	33	37	35	32	35	33	32	34	32	31	30
3	39	34	31	28	38	34	30	28	32	30	27	31	29	27	30	28	26	25
4	36	30	27	24	35	30	26	23	29	26	23	28	25	23	27	24	23	22
5	33	27	23	20	32	27	23	20	26	23	20	25	22	20	24	22	20	19
6	30	24	21	18	29	24	20	18	23	20	18	23	20	17	22	19	17	16
7	28	22	18	16	27	22	18	16	21	18	15	21	18	15	20	17	15	14
8	26	20	17	14	25	20	16	14	19	16	14	19	16	14	18	16	14	13
9	24	19	15	13	24	18	15	13	18	15	12	17	14	12	17	14	12	12
10	23	17	14	11	22	17	14	11	16	13	11	16	13	11	16	13	11	10

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

	0°	90°	180°
0°	8634	8634	8634
5°	8730	8730	8730
10°	8703	8703	8703
15°	8677	8677	8677
20°	8584	8584	8584
25°	8483	8553	8483
30°	8514	8441	8514
35°	8463	8309	8463
40°	8309	8309	8309
45°	8199	8110	8199
50°	8039	7843	8039
55°	7911	7691	7911
60°	7689	7436	7689
65°	7456	7158	7456
70°	7002	6818	7002
75°	6574	6331	6574
80°	5444	5444	5444
85°	4338	4338	4338



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture	% Lamp
0°-10°	13.0	3.3	1.4
10°-20°	37.2	9.5	4.1
20°-30°	56.1	14.4	6.2
30°-40°	67.5	17.3	7.5
40°-50°	69.9	17.9	7.8
50°-60°	63.0	16.1	7.0
60°-70°	48.3	12.4	5.4
70°-80°	27.8	7.1	3.1
80°-90°	7.7	2.0	0.9
90°-100°	0.0	0.0	0.0
100°-110°	0.0	0.0	0.0
110°-120°	0.0	0.0	0.0
120°-130°	0.0	0.0	0.0
130°-140°	0.0	0.0	0.0
140°-150°	0.0	0.0	0.0
150°-160°	0.0	0.0	0.0
160°-170°	0.0	0.0	0.0
170°-180°	0.0	0.0	0.0
0°-30°	106.3	27.2	11.8
0°-40°	173.8	44.5	19.3
0°-60°	306.6	78.5	34.1
0°-90°	390.4	100.0	43.4
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°	390.4	100.0	43.4

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	137	137	137	137	137	
5°	138	136	138	136	138	13
15°	133	132	133	132	133	37
25°	122	121	123	121	122	57
35°	110	108	108	108	110	68
45°	92	90	91	90	92	71
55°	72	71	70	71	72	64
65°	50	49	48	49	50	49
75°	27	27	26	27	27	28
85°	6	7	6	7	6	8
90°	1	1	1	1	1	



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**CANDELA DISTRIBUTION (FULL):**

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	137	137	137	137	137	137	137	137	137	137	137
2.5°	138	138	137	136	136	136	137	138	138	138	138
5°	138	137	137	135	135	136	137	137	138	138	138
7.5°	136	137	137	134	135	135	136	136	137	137	137
10°	136	136	135	133	134	135	135	135	136	135	136
12.5°	134	134	133	132	133	133	134	134	135	134	134
15°	133	133	132	130	131	132	132	132	132	133	133
17.5°	131	130	130	128	129	129	130	130	130	131	131
20°	128	128	127	126	126	127	127	128	127	128	128
22.5°	126	125	124	123	125	125	125	125	125	125	125
25°	122	123	121	120	121	121	122	122	123	122	123
27.5°	120	120	118	117	118	119	119	119	120	119	119
30°	117	116	115	114	115	115	116	116	117	116	116
32.5°	113	113	111	111	111	111	112	112	112	112	112
35°	110	109	108	107	107	108	107	108	108	108	108
37.5°	105	104	103	103	103	103	104	104	105	105	104
40°	101	101	99	98	99	100	100	99	100	100	101
42.5°	96	96	95	95	95	95	96	95	95	95	95
45°	92	91	90	90	90	90	91	91	91	91	91
47.5°	87	87	86	85	86	86	85	86	86	85	86
50°	82	82	81	80	81	81	81	81	81	81	80
52.5°	77	76	76	75	76	76	76	75	76	75	76
55°	72	71	70	70	70	71	70	71	70	70	70
57.5°	66	66	65	65	65	65	65	65	65	65	65
60°	61	61	60	60	59	60	60	60	60	59	59
62.5°	55	55	55	54	55	55	54	54	54	54	54
65°	50	49	49	49	49	49	49	49	48	48	48
67.5°	44	44	43	43	43	44	43	43	43	43	43
70°	38	38	38	38	38	38	37	37	37	37	37
72.5°	33	32	32	31	32	32	32	31	31	32	32
75°	27	27	26	26	26	27	26	26	26	26	26
77.5°	21	21	21	20	21	21	21	21	21	21	20
80°	15	16	16	15	15	16	16	15	15	15	15
82.5°	11	11	11	11	11	11	11	11	11	11	10
85°	6	6	6	6	7	7	7	6	6	6	6
87.5°	3	3	3	3	3	3	3	3	3	3	2
90°	1	1	1	1	1	1	1	1	1	1	1



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**CANDELA DISTRIBUTION (continued):**

	95°	105°	115°	125°	135°	145°	155°	165°	175°	180°
0°	137	137	137	137	137	137	137	137	137	137
2.5°	138	138	138	137	136	136	136	137	138	138
5°	138	138	137	137	136	135	135	137	137	138
7.5°	137	137	136	136	135	135	134	137	137	136
10°	135	136	135	135	135	134	133	135	136	136
12.5°	134	135	134	134	133	133	132	133	134	134
15°	133	132	132	132	132	131	130	132	133	133
17.5°	131	130	130	130	129	129	128	130	130	131
20°	128	127	128	127	127	126	126	127	128	128
22.5°	125	125	125	125	125	125	123	124	125	126
25°	122	123	122	122	121	121	120	121	123	122
27.5°	119	120	119	119	119	118	117	118	120	120
30°	116	117	116	116	115	115	114	115	116	117
32.5°	112	112	112	112	111	111	111	111	113	113
35°	108	108	108	107	108	107	107	108	109	110
37.5°	105	105	104	104	103	103	103	103	104	105
40°	100	100	99	100	100	99	98	99	101	101
42.5°	95	95	95	96	95	95	95	95	96	96
45°	91	91	91	91	90	90	90	90	91	92
47.5°	85	86	86	85	86	86	85	86	87	87
50°	81	81	81	81	81	81	80	81	82	82
52.5°	75	76	75	76	76	76	75	76	76	77
55°	70	70	71	70	71	70	70	70	71	72
57.5°	65	65	65	65	65	65	65	65	66	66
60°	59	60	60	60	60	59	60	60	61	61
62.5°	54	54	54	54	55	55	54	55	55	55
65°	48	48	49	49	49	49	49	49	49	50
67.5°	43	43	43	43	44	43	43	43	44	44
70°	37	37	37	37	38	38	38	38	38	38
72.5°	32	31	31	32	32	32	31	32	32	33
75°	26	26	26	26	27	26	26	26	27	27
77.5°	21	21	21	21	21	21	20	21	21	21
80°	15	15	15	16	16	15	15	16	16	15
82.5°	11	11	11	11	11	11	11	11	11	11
85°	6	6	6	7	7	7	6	6	6	6
87.5°	3	3	3	3	3	3	3	3	3	3
90°	1	1	1	1	1	1	1	1	1	1

(END OF REPORT)