

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: HALO

Report Number: P85093

Luminaire Tested: **ELSG405840TBZ (25deg Beam-35deg tilt)**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P85093  
Test Lab: INNOVATION CENTER P2  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: ELSG405840TBZ (25deg Beam-35deg tilt)  
Description: HALO 4 INCH RECESSED FIXTURE WITH SQUARE TUSCAN BRONZE TRIM, TUSCAN BRONZE GIMBAL, NARROW UPPER REFLECTOR AND CLEAR LENS .  
---ABSOLUTE PHOTOMETRY IS BASED ON CALIBRATION FACTORS  
CREATED USING A 500 WATT, NIST TRACEABLE, OMNI-DIRECTIONAL LAB LUMEN STANDARD IN THE GONIOPHOTOMETER WITH TEST DISTANCE OF 28.75 FEET----  
Light Source: (1) SMT LED 4000K  
(1) SMT LED 4000K  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: 654 (1 lamp)  
Luminaire Lumens: 653.8 lumens  
Efficiency: 100.0%  
Efficacy: 48.1 lumens/watt  
Spacing Criteria (0/90/45): 2.59 / 0.66 / 1.56  
Luminous Opening: Vertical Cylinder (Dia: 0.33' x H: 0.1')  
CIE Type: Direct

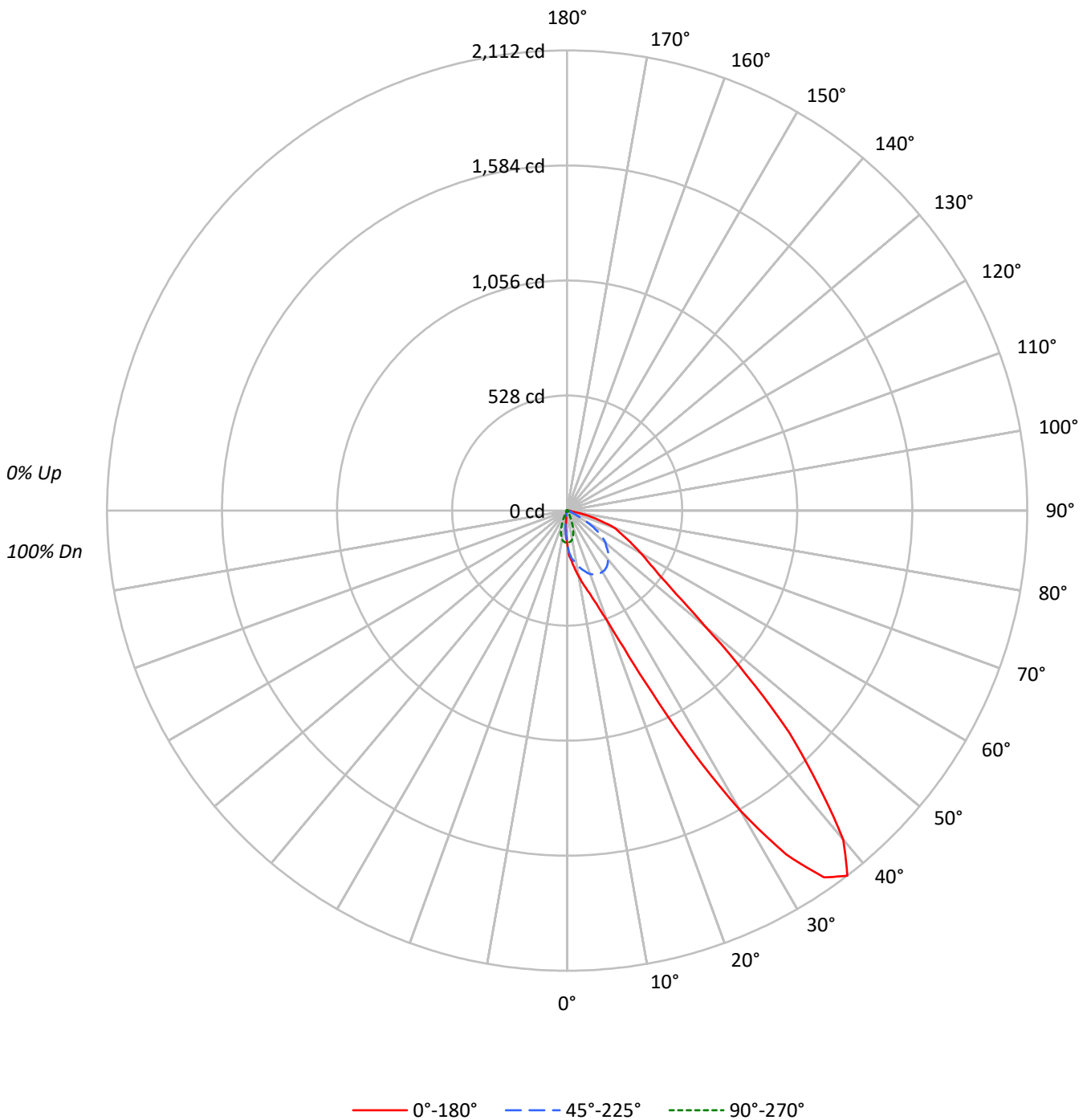
Input Watts (W): 13.6  
Input Voltage (V): NR  
Input Current (Ain): 0.1191  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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CATALOG NUMBER: ELSG405840TBZ (25deg Beam-35deg tilt)

### 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	50	30	10	50	30	10	0		
RCR																										
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100					100			
1	110	106	102	99	107	104	100	97	100	97	94	96	93	91	92	90	89					87				
2	101	93	87	82	98	92	86	81	88	83	79	85	81	77	82	79	76					74				
3	92	83	75	69	90	81	74	68	78	72	67	75	70	66	73	69	65					63				
4	85	73	65	59	82	72	64	58	70	63	57	67	61	57	65	60	56					54				
5	78	65	57	50	76	64	56	50	62	55	50	60	54	49	58	53	48					46				
6	72	59	50	44	70	58	49	43	56	49	43	54	48	43	53	47	42					40				
7	66	53	44	38	64	52	44	38	50	43	38	49	42	37	48	42	37					35				
8	61	48	39	34	60	47	39	34	46	39	33	45	38	33	43	37	33					31				
9	57	44	35	30	55	43	35	30	42	35	30	41	34	29	40	34	29					27				
10	53	40	32	27	52	39	32	27	38	31	26	37	31	26	36	31	26					24				

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

	0°	90°	180°
0°	18255	18255	18255
5°	27785	17325	8075
10°	35896	15677	2077
15°	45155	12661	1541
20°	61965	8274	507
25°	105621	4078	254
30°	185670	1937	128
35°	244127	1711	131
40°	240467	1475	134
45°	181888	694	0
50°	108617	435	0
55°	71756	153	0
60°	57872	163	0
65°	47474	176	0
70°	41000	194	0
75°	23440	216	0
80°	3971	247	247
85°	3798	290	0



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**ZONAL LUMENS:**

Zone	Lumens	% Fixture	% Lamp
0°-10°	14.1	2.2	2.2
10°-20°	44.1	6.7	6.7
20°-30°	96.8	14.8	14.8
30°-40°	175.1	26.8	26.8
40°-50°	154.7	23.7	23.7
50°-60°	91.6	14.0	14.0
60°-70°	54.6	8.4	8.4
70°-80°	19.6	3.0	3.0
80°-90°	3.1	0.5	0.5
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°	155.0	23.7	23.7
0°-40°	330.1	50.5	50.5
0°-60°	576.5	88.2	88.1
0°-90°	653.8	100.0	100.0
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°	653.8	100.0	100.0

**CANDELA DISTRIBUTION:**

	0°	45°	90°	135°	180°	Flux
0°	148	148	148	148	148	
5°	232	218	145	84	67	24
15°	390	283	109	14	13	117
25°	914	322	35	6	2	466
35°	2055	316	14	1	1	1233
45°	1441	265	6	1	0	1083
55°	516	177	1	1	0	489
65°	296	35	1	1	0	298
75°	119	12	1	1	0	126
85°	14	2	1	1	0	13
90°	0	0	0	0	0	



TEST NUMBER: P85093

CATALOG NUMBER: ELSG405840TBZ (25deg Beam-35deg tilt)

**CANDELA DISTRIBUTION (FULL):**

	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
0°	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0
2.5°	206.5	205.4	205.4	204.3	203.2	201.0	199.9	195.4	192.1	188.8	184.4
5°	231.9	230.8	230.8	229.7	228.6	227.5	226.4	224.2	220.8	217.5	213.1
7.5°	269.4	268.3	268.3	265.0	260.6	256.2	250.7	244.0	238.5	231.9	226.4
10°	305.9	303.7	301.4	295.9	290.4	282.7	277.2	270.5	260.6	251.8	241.8
12.5°	346.7	345.6	342.3	335.7	327.9	316.9	307.0	292.6	279.4	268.3	256.2
15°	389.8	388.7	383.2	374.3	362.2	347.8	333.5	316.9	299.2	282.7	268.3
17.5°	449.4	446.1	437.3	422.9	401.9	380.9	362.2	340.1	319.1	298.1	278.3
20°	537.7	532.2	515.7	488.1	457.1	425.1	392.0	361.1	334.6	310.3	286.0
22.5°	683.5	672.5	637.1	585.2	528.9	474.8	428.4	383.2	347.8	316.9	290.4
25°	914.3	886.7	810.5	716.6	622.8	534.4	467.1	407.4	360.0	322.4	290.4
27.5°	1241.1	1189.2	1054.5	884.5	724.4	596.3	500.2	428.4	367.7	324.6	289.3
30°	1591.1	1520.5	1319.5	1070.0	828.1	648.2	523.4	441.7	373.2	324.6	286.0
32.5°	1870.5	1793.2	1532.6	1219.0	914.3	680.2	531.1	443.9	373.2	322.4	281.6
35°	2054.9	1986.4	1659.6	1295.2	952.9	684.6	525.6	436.2	367.7	315.8	276.0
37.5°	2112.3	2027.3	1668.4	1288.6	934.1	661.4	506.8	420.7	355.6	305.9	266.1
40°	1972.1	1867.2	1554.7	1203.6	862.4	616.1	483.6	400.8	343.4	292.6	255.1
42.5°	1702.7	1616.5	1367.0	1050.1	755.3	558.7	454.9	379.8	325.7	279.4	238.5
45°	1441.0	1353.7	1135.1	865.7	649.3	506.8	424.0	358.9	307.0	265.0	226.4
47.5°	1116.3	1049.0	886.7	711.1	563.1	466.0	392.0	334.6	287.1	244.0	208.7
50°	823.7	785.1	697.9	593.0	500.2	420.7	362.2	309.2	267.2	229.7	181.1
52.5°	630.5	609.5	563.1	504.6	438.4	376.5	326.8	282.7	246.2	207.6	149.1
55°	515.7	504.6	479.2	433.9	385.4	335.7	294.8	260.6	225.3	176.7	118.1
57.5°	443.9	433.9	413.0	378.7	340.1	300.3	268.3	238.5	199.9	141.3	86.1
60°	389.8	383.2	363.3	335.7	302.5	271.6	246.2	214.2	165.6	106.0	51.9
62.5°	341.2	335.7	320.2	297.0	271.6	246.2	223.0	182.2	124.8	68.5	26.5
65°	295.9	292.6	283.8	266.1	246.2	223.0	191.0	139.1	82.8	35.3	16.6
67.5°	258.4	256.2	249.5	237.4	218.6	191.0	149.1	90.5	45.3	19.9	15.5
70°	233.0	229.7	221.9	205.4	182.2	143.5	95.0	49.7	22.1	15.5	13.3
72.5°	168.9	168.9	166.7	154.6	128.1	90.5	51.9	25.4	15.5	13.3	12.1
75°	119.3	118.1	117.0	104.9	77.3	45.3	25.4	15.5	13.3	12.1	7.7
77.5°	67.4	67.4	67.4	55.2	36.4	21.0	16.6	14.4	12.1	8.8	5.5
80°	17.7	16.6	17.7	17.7	16.6	14.4	13.3	12.1	9.9	4.4	3.3
82.5°	13.3	12.1	13.3	13.3	13.3	12.1	12.1	8.8	4.4	2.2	2.2
85°	14.4	13.3	14.4	12.1	12.1	9.9	9.9	5.5	3.3	2.2	2.2
87.5°	12.1	12.1	11.0	9.9	8.8	6.6	5.5	3.3	2.2	2.2	2.2
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P85093

CATALOG NUMBER: ELSG405840TBZ (25deg Beam-35deg tilt)

**CANDELA DISTRIBUTION (continued):**

	55°	60°	65°	70°	75°	80°	85°	90°	112.5°	135°	157.5°
0°	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0	148.0
2.5°	178.9	174.5	168.9	163.4	157.9	154.6	150.2	148.0	136.9	125.9	113.7
5°	206.5	199.9	189.9	180.0	168.9	160.1	151.3	144.6	117.0	83.9	71.8
7.5°	220.8	214.2	205.4	194.3	178.9	164.5	151.3	141.3	90.5	57.4	28.7
10°	233.0	221.9	212.0	201.0	185.5	166.7	148.0	133.6	68.5	23.2	17.7
12.5°	242.9	230.8	216.4	203.2	186.6	164.5	141.3	122.6	44.2	17.7	14.4
15°	252.9	237.4	221.9	204.3	184.4	160.1	131.4	109.3	23.2	14.4	13.3
17.5°	261.7	242.9	225.3	204.3	181.1	150.2	118.1	92.8	16.6	14.4	11.0
20°	266.1	246.2	225.3	202.1	174.5	138.0	102.7	71.8	14.4	11.0	5.5
22.5°	267.2	245.1	221.9	196.5	162.3	121.5	82.8	51.9	13.3	8.8	2.2
25°	265.0	241.8	216.4	186.6	146.9	101.6	62.9	35.3	13.3	5.5	1.1
27.5°	260.6	235.2	207.6	173.4	127.0	78.4	44.2	24.3	9.9	2.2	1.1
30°	255.1	228.6	197.7	155.7	104.9	58.5	29.8	16.6	7.7	2.2	1.1
32.5°	251.8	220.8	183.3	134.7	79.5	40.9	21.0	15.5	4.4	1.1	1.1
35°	244.0	207.6	164.5	109.3	58.5	26.5	15.5	14.4	2.2	1.1	1.1
37.5°	230.8	192.1	140.2	85.0	38.6	17.7	14.4	14.4	1.1	1.1	0.0
40°	216.4	172.3	114.8	61.8	24.3	15.5	14.4	12.1	1.1	1.1	0.0
42.5°	201.0	145.8	89.4	39.8	16.6	14.4	13.3	8.8	1.1	1.1	0.0
45°	177.8	120.4	62.9	23.2	14.4	13.3	11.0	5.5	1.1	1.1	0.0
47.5°	149.1	92.8	38.6	16.6	13.3	12.1	6.6	4.4	1.1	1.1	0.0
50°	122.6	65.1	22.1	14.4	12.1	9.9	4.4	3.3	1.1	1.1	0.0
52.5°	90.5	37.5	15.5	12.1	9.9	4.4	2.2	1.1	0.0	1.1	0.0
55°	61.8	21.0	13.3	12.1	7.7	3.3	1.1	1.1	1.1	1.1	0.0
57.5°	33.1	16.6	12.1	9.9	4.4	2.2	1.1	2.2	1.1	1.1	0.0
60°	19.9	14.4	12.1	6.6	3.3	2.2	1.1	1.1	1.1	1.1	0.0
62.5°	15.5	13.3	8.8	3.3	1.1	1.1	1.1	1.1	1.1	1.1	0.0
65°	13.3	11.0	4.4	2.2	1.1	1.1	1.1	1.1	1.1	1.1	0.0
67.5°	13.3	8.8	3.3	2.2	1.1	1.1	1.1	1.1	1.1	1.1	0.0
70°	9.9	4.4	2.2	2.2	1.1	1.1	1.1	1.1	1.1	1.1	0.0
72.5°	6.6	4.4	2.2	2.2	1.1	2.2	2.2	1.1	1.1	1.1	0.0
75°	4.4	2.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.0
77.5°	2.2	2.2	1.1	1.1	1.1	1.1	1.1	2.2	1.1	1.1	0.0
80°	2.2	2.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.0
82.5°	2.2	2.2	1.1	1.1	0.0	1.1	1.1	1.1	0.0	1.1	0.0
85°	2.2	2.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.0
87.5°	2.2	2.2	1.1	1.1	1.1	1.1	1.1	2.2	1.1	1.1	1.1
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



TEST NUMBER: P85093

CATALOG NUMBER: ELSG405840TBZ (25deg Beam-35deg tilt)

**CANDELA DISTRIBUTION (continued):**

	180°
0°	148.0
2.5°	109.3
5°	67.4
7.5°	22.1
10°	17.7
12.5°	13.3
15°	13.3
17.5°	8.8
20°	4.4
22.5°	2.2
25°	2.2
27.5°	1.1
30°	1.1
32.5°	1.1
35°	1.1
37.5°	1.1
40°	1.1
42.5°	0.0
45°	0.0
47.5°	0.0
50°	0.0
52.5°	0.0
55°	0.0
57.5°	0.0
60°	0.0
62.5°	0.0
65°	0.0
67.5°	1.1
70°	0.0
72.5°	1.1
75°	0.0
77.5°	0.0
80°	1.1
82.5°	0.0
85°	0.0
87.5°	1.1
90°	0.0

(END OF REPORT)