

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: HALO

Report Number: P601176

Luminaire Tested: **ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K**

Issue Date: 7/29/2022

Tested By:

Approved By:



Cooper Lighting Solutions laboratories have been accredited by National Voluntary Laboratory Accreditation Program (NVLAP) that it adheres to the requirements of ISO/IEC 17025:2005 and appropriate IESNA test methods. This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government. Results contained in this report are valid for luminaire sample tested, as supplied by requestor. Information related to the luminaire tested has been supplied by requestor and can affect the validity of the test results. Report shall not be reproduced except in full without approval of Cooper Lighting Solutions Lighting Laboratory. Test performed at address noted above.

Test Information

Test Method: LM-79-08
 Report Number: P601176
 Test Lab: COOPER LIGHTING SOLUTIONS
 Issue Date: 7/29/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: HALO
 Catalog Number: ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K
 Description: RETROFIT, 25D WW OPTIC, LINEAR SPREAD LENS TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 2700K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 610.0 lumens
 Efficiency: N/A
 Efficacy: 73.5 lumens/watt
 Spacing Criteria (0/90/45): 1.21 / 0.78 / 1
 Luminous Opening: Circular (Dia: 0.21' x H: 0')
 CIE Type: Direct

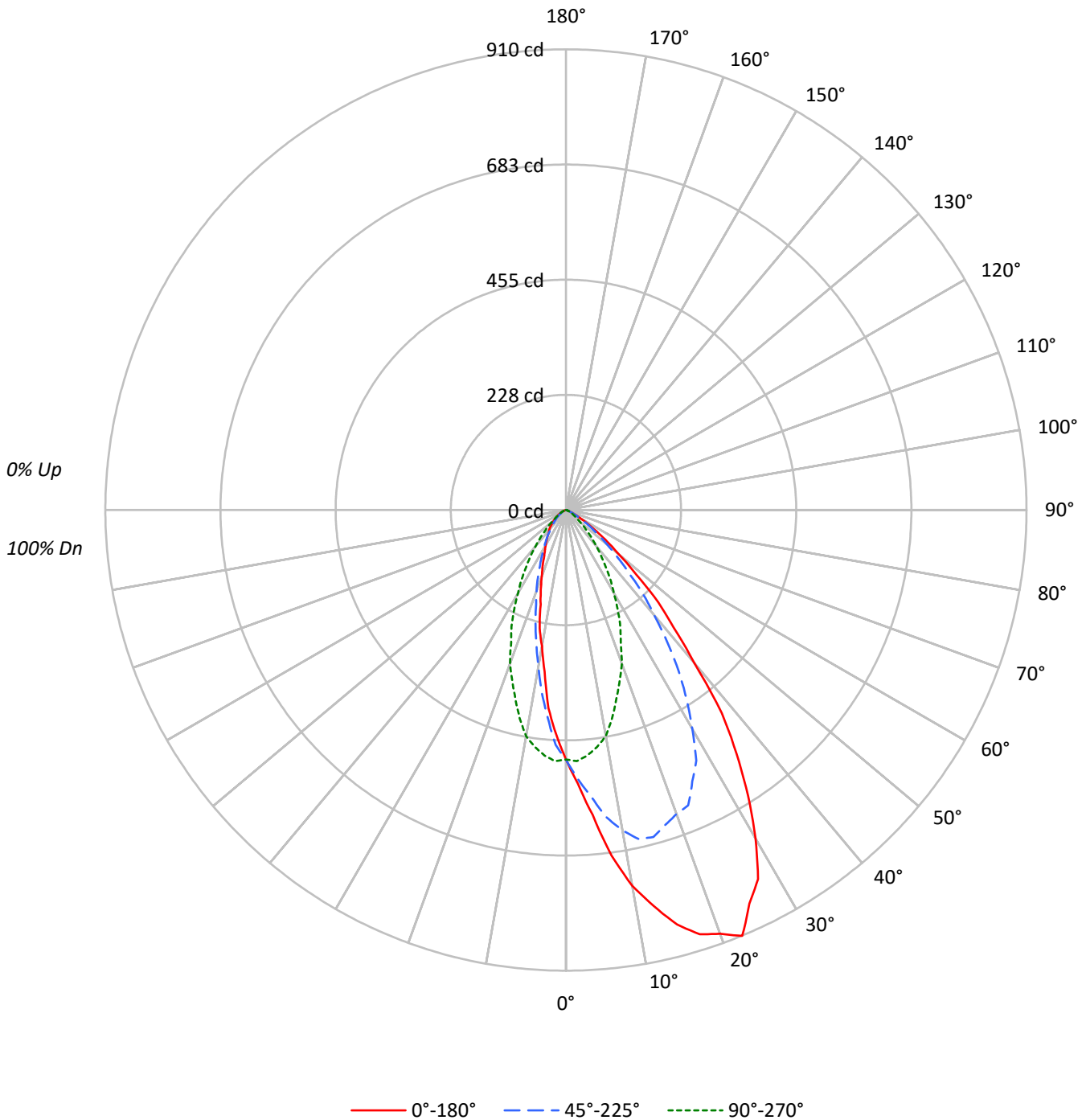
Input Watts (W): 8.3
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



Meas		Calibration Due Date	
Instrument	Identificatio		
Photometer	GONIO 1 11111111	4/22/2021	10/22/2021
Power Meter	XITRON 2801 IN0197	12/1/2020	12/1/2021
AC Power Source	CHROMA 61505 IN0196	12/1/2020	12/1/2021
DC Power Supply	AGILENT E3634A IN0198	11/30/2020	11/30/2021
Room Thermometer	ONSET IN0143	12/1/2020	12/1/2021

TEST NUMBER: P601176
CATALOG NUMBER: ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K

Luminous Intensity Polar Plot



TEST NUMBER: P601176

CATALOG NUMBER: ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K

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
RCR																				
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100	100	100
1	113	110	107	104	110	107	105	103	103	101	99	100	98	96	96	95	94	92	92	92
2	106	100	96	92	104	99	95	91	95	92	89	92	90	87	90	87	85	83	83	83
3	100	92	87	82	98	91	86	81	88	84	80	86	82	79	83	80	78	76	76	76
4	94	85	79	74	92	84	78	73	82	76	72	79	75	72	78	74	71	69	69	69
5	88	78	72	67	86	77	71	67	76	70	66	74	69	65	72	68	65	63	63	63
6	83	73	66	61	81	72	65	61	70	65	60	69	64	60	67	63	59	58	58	58
7	78	68	61	56	77	67	60	56	65	60	55	64	59	55	63	58	55	53	53	53
8	74	63	56	52	72	62	56	51	61	55	51	60	55	51	59	54	51	49	49	49
9	70	59	52	48	68	58	52	48	57	52	47	56	51	47	55	51	47	46	46	46
10	66	55	49	44	65	55	48	44	54	48	44	53	48	44	52	47	44	42	42	42

AVERAGE LUMINANCE (cd/sqm):

	0°	90°	180°
0°	155578	155578	155578
5°	191609	154238	124633
10°	241503	145377	87470
15°	277149	126120	63060
20°	299336	108571	46641
25°	298795	88600	35538
30°	273278	68985	29133
35°	226391	52579	24169
40°	162573	38500	21270
45°	115212	26347	17550
50°	67595	16899	14492
55°	40573	11506	11506
60°	21725	8526	8526
65°	11955	6426	5529
70°	6832	4524	3416
75°	3050	3050	0
80°	2182	2182	0
85°	0	0	0

TEST NUMBER: P601176
 CATALOG NUMBER: ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	46.7	7.7
10°-20°	127.0	20.8
20°-30°	166.0	27.2
30°-40°	142.4	23.3
40°-50°	81.4	13.4
50°-60°	33.3	5.5
60°-70°	10.6	1.7
70°-80°	2.3	0.4
80°-90°	0.2	0.0
90°-100°	0.0	0.0
100°-110°	0.0	0.0
110°-120°	0.0	0.0
120°-130°	0.0	0.0
130°-140°	0.0	0.0
140°-150°	0.0	0.0
150°-160°	0.0	0.0
160°-170°	0.0	0.0
170°-180°	0.0	0.0
0°-30°	339.7	55.7
0°-40°	482.1	79.0
0°-60°	596.9	97.8
0°-90°	610.0	100.0
90°-120°	0.0	0.0
90°-150°	0.0	0.0
90°-180°	0.0	0.0
0°-180°	610.0	100.0

CANDELA DISTRIBUTION:

	0°	45°	90°	135°	180°	Flux
0°	493	493	493	493	493	
5°	604	568	487	412	393	63
15°	848	668	386	232	193	239
25°	858	591	254	122	102	393
35°	587	388	136	64	63	363
45°	258	176	59	32	39	196
55°	74	60	21	15	21	70
65°	16	14	9	6	7	17
75°	2	2	2	1	0	3
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

TEST NUMBER: P601176

CATALOG NUMBER: ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K

CANDELA DISTRIBUTION (FULL):

	0°	5°	10°	15°	20°	22.5°	45°	67.5°	90°	112.5°	135°
0°	492.7	492.7	492.7	492.7	492.7	492.7	492.7	492.7	492.7	492.7	492.7
2.5°	540.6	551.7	548.0	554.1	552.9	541.9	530.8	513.6	496.4	486.6	464.4
5°	604.5	618.0	627.9	620.5	616.8	608.2	567.7	529.6	486.6	443.6	411.6
7.5°	688.1	684.4	695.4	673.3	674.6	670.9	611.9	538.2	471.8	409.2	363.7
10°	753.2	742.1	753.2	745.8	731.1	713.9	642.6	534.5	453.4	374.8	313.3
12.5°	801.1	815.9	815.9	798.7	783.9	764.2	666.0	532.0	421.4	333.0	270.3
15°	847.8	852.7	844.1	830.6	815.9	775.3	668.4	516.1	385.8	292.4	232.2
17.5°	878.5	879.7	876.1	863.8	842.9	818.3	652.4	501.3	352.6	260.5	195.4
20°	890.8	881.0	879.7	857.6	839.2	817.1	638.9	465.7	323.1	222.4	169.6
22.5°	910.5	887.1	887.1	865.0	826.9	823.2	631.5	425.1	282.6	190.4	145.0
25°	857.6	853.9	861.3	830.6	801.1	795.0	591.0	394.4	254.3	164.6	121.6
27.5°	822.0	812.2	802.3	782.7	754.4	739.7	557.8	355.1	221.2	137.6	103.2
30°	749.5	749.5	737.2	727.4	689.3	678.2	498.9	318.2	189.2	118.0	86.0
32.5°	669.6	658.6	659.8	648.8	625.4	616.8	443.6	277.7	163.4	95.8	75.0
35°	587.3	575.0	568.9	560.3	556.6	529.6	388.3	239.6	136.4	83.6	63.9
37.5°	506.2	493.9	489.0	475.5	455.8	449.7	328.1	199.0	114.3	68.8	52.8
40°	394.4	394.4	393.2	378.4	372.3	368.6	271.5	165.9	93.4	55.3	45.5
42.5°	314.5	318.2	315.8	309.6	296.1	293.7	226.1	135.2	76.2	46.7	38.1
45°	258.0	247.0	244.5	243.3	235.9	234.7	175.7	106.9	59.0	38.1	31.9
47.5°	189.2	188.0	190.4	184.3	175.7	183.1	138.8	81.1	46.7	30.7	27.0
50°	137.6	140.1	140.1	133.9	131.5	133.9	106.9	61.4	34.4	24.6	23.3
52.5°	103.2	102.0	100.8	102.0	100.8	100.8	79.9	45.5	27.0	19.7	18.4
55°	73.7	73.7	72.5	75.0	76.2	73.7	60.2	33.2	20.9	16.0	14.7
57.5°	51.6	51.6	49.1	51.6	51.6	54.1	43.0	24.6	17.2	12.3	12.3
60°	34.4	34.4	34.4	35.6	36.9	36.9	29.5	17.2	13.5	9.8	9.8
62.5°	23.3	23.3	23.3	24.6	24.6	27.0	20.9	13.5	11.1	8.6	7.4
65°	16.0	16.0	16.0	16.0	17.2	17.2	13.5	9.8	8.6	7.4	6.1
67.5°	9.8	11.1	9.8	11.1	11.1	11.1	8.6	7.4	6.1	4.9	3.7
70°	7.4	7.4	7.4	7.4	7.4	7.4	6.1	6.1	4.9	3.7	2.5
72.5°	4.9	4.9	4.9	4.9	4.9	4.9	3.7	3.7	3.7	2.5	2.5
75°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	1.2	1.2
77.5°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0
80°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0
82.5°	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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: P601176
 CATALOG NUMBER: ML406AWW9FS1E - TIR4D25AWW - TL45R6G_ TL46S6G_ 2700K

CANDELA DISTRIBUTION (continued):

	157.5°	180°
0°	492.7	492.7
2.5°	452.2	443.6
5°	383.4	393.2
7.5°	334.2	321.9
10°	280.1	272.8
12.5°	243.3	239.6
15°	201.5	192.9
17.5°	173.2	164.6
20°	145.0	138.8
22.5°	124.1	120.4
25°	106.9	102.0
27.5°	92.2	89.7
30°	79.9	79.9
32.5°	68.8	71.3
35°	61.4	62.7
37.5°	52.8	55.3
40°	49.1	51.6
42.5°	41.8	46.7
45°	35.6	39.3
47.5°	30.7	34.4
50°	25.8	29.5
52.5°	23.3	25.8
55°	19.7	20.9
57.5°	16.0	17.2
60°	12.3	13.5
62.5°	9.8	11.1
65°	7.4	7.4
67.5°	4.9	6.1
70°	2.5	3.7
72.5°	1.2	1.2
75°	1.2	0.0
77.5°	0.0	0.0
80°	0.0	0.0
82.5°	0.0	0.0
85°	0.0	0.0
87.5°	0.0	0.0
90°	0.0	0.0

(END OF REPORT)