

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



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: INVUE

Report Number: P879709

Luminaire Tested: **EMM2-HSN-VA9-730-U-MQ**

Issue Date: 10/01/2024



Test Information

Test Method: LM-79-08
Report Number: P879709
Test Lab: INNOVATION CENTER(G3)
Issue Date: 10/01/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-VA9-730-U-MQ
Description: EPIC MODERN SHORT HOUSING 9W 70CRI 3000K WAVESTREAM FIXTURE w/
TYPE V MEDIUM DISTRIBUTION OPTIC
Light Source: (1) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

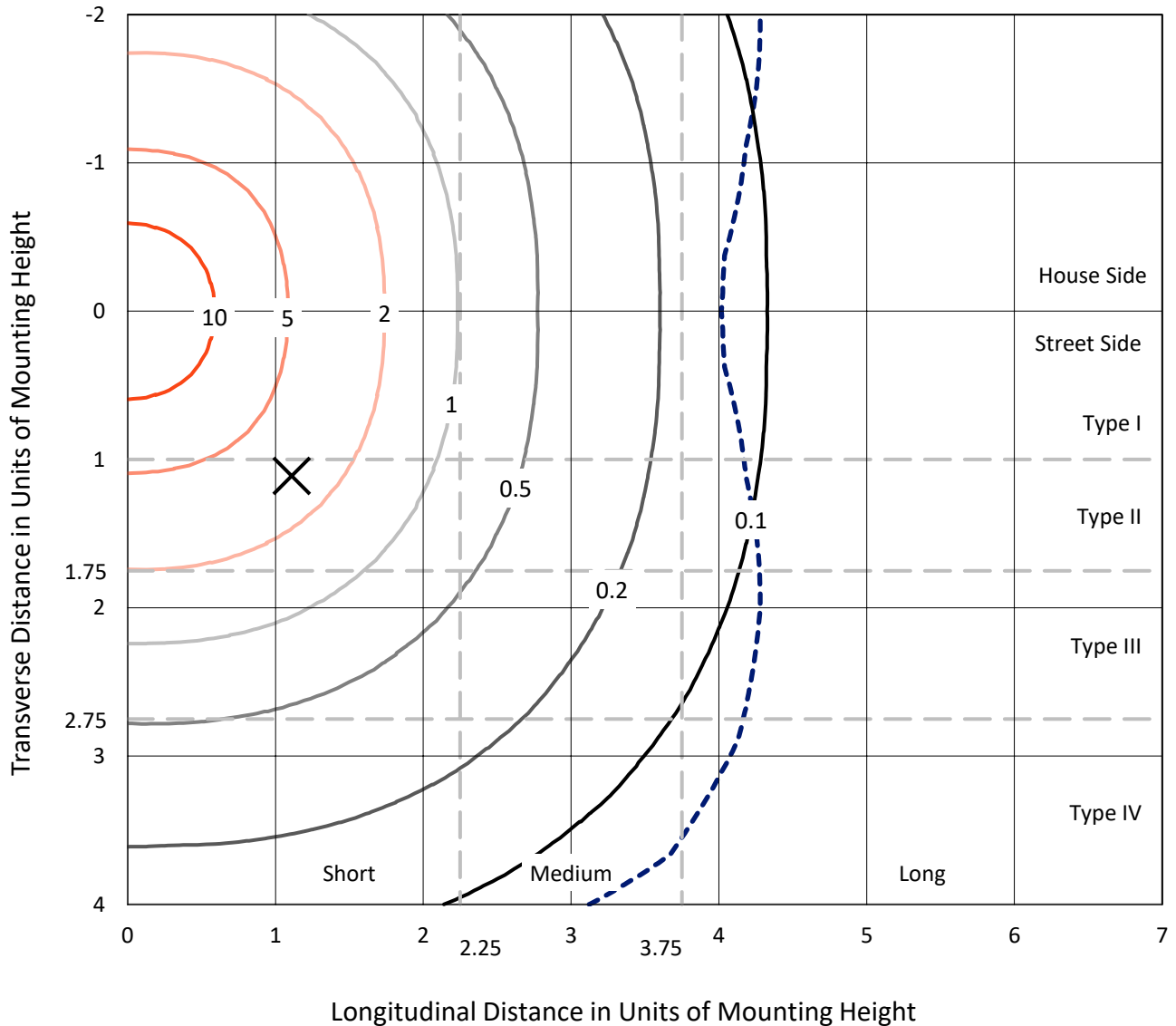
Lumens per Lamp: N/A
Luminaire Lumens: 18824.6 lumens
Efficiency: N/A
Efficacy: 110.7 lumens/watt
Luminous Opening: Circular (Dia: 1.12' x H: 0')
IES Classification: Type V - Short
BUG Rating: B4 - U0 - G3

Input Watts (W): 170
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.995
Total Harmonic Distortion (THDi): 5.9%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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Iso-Footcandle Lines of Horizontal Illumination

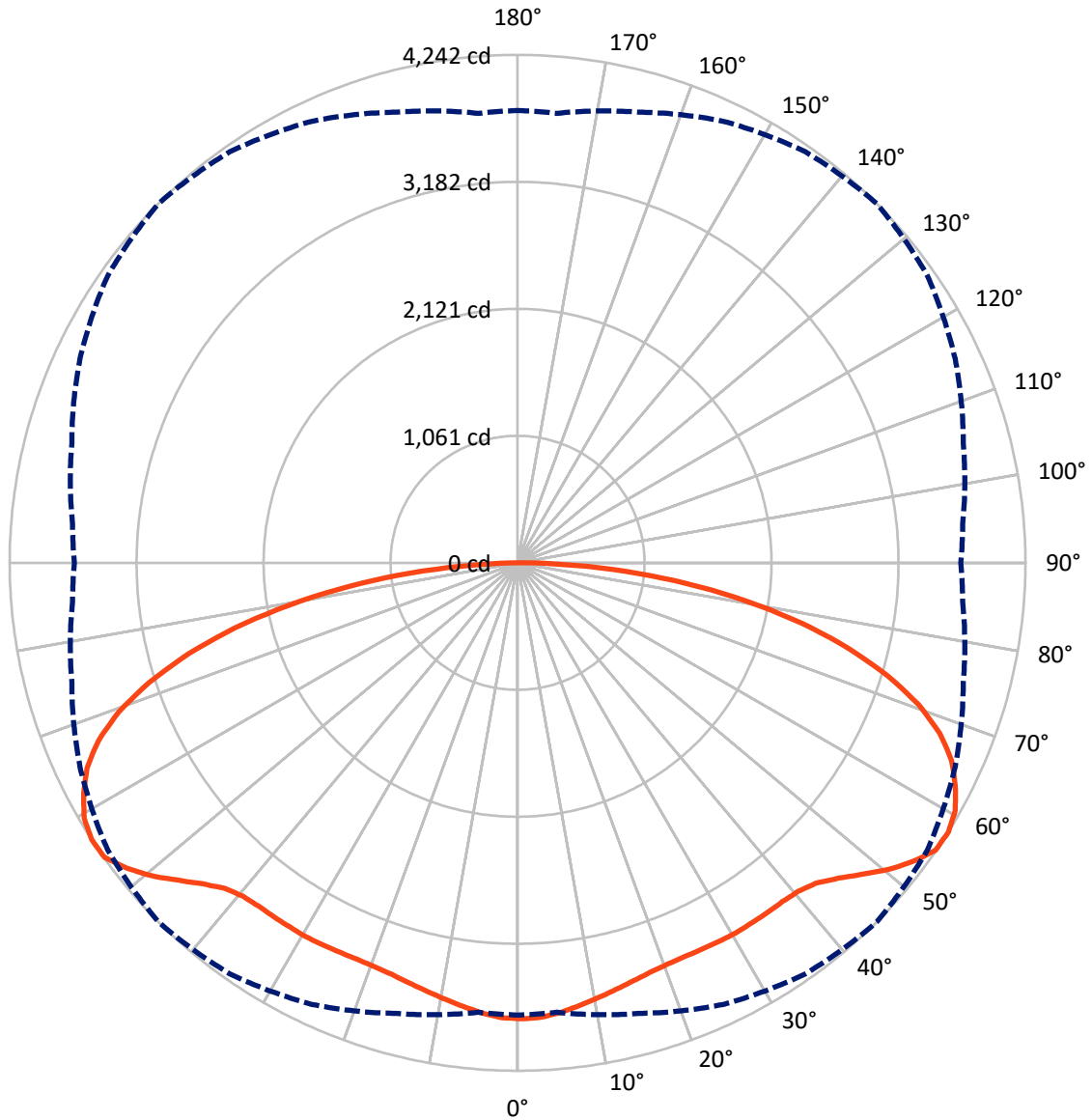
✕ Max cd
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 16.9 fc
 Type V - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 57.5-Deg Vertical

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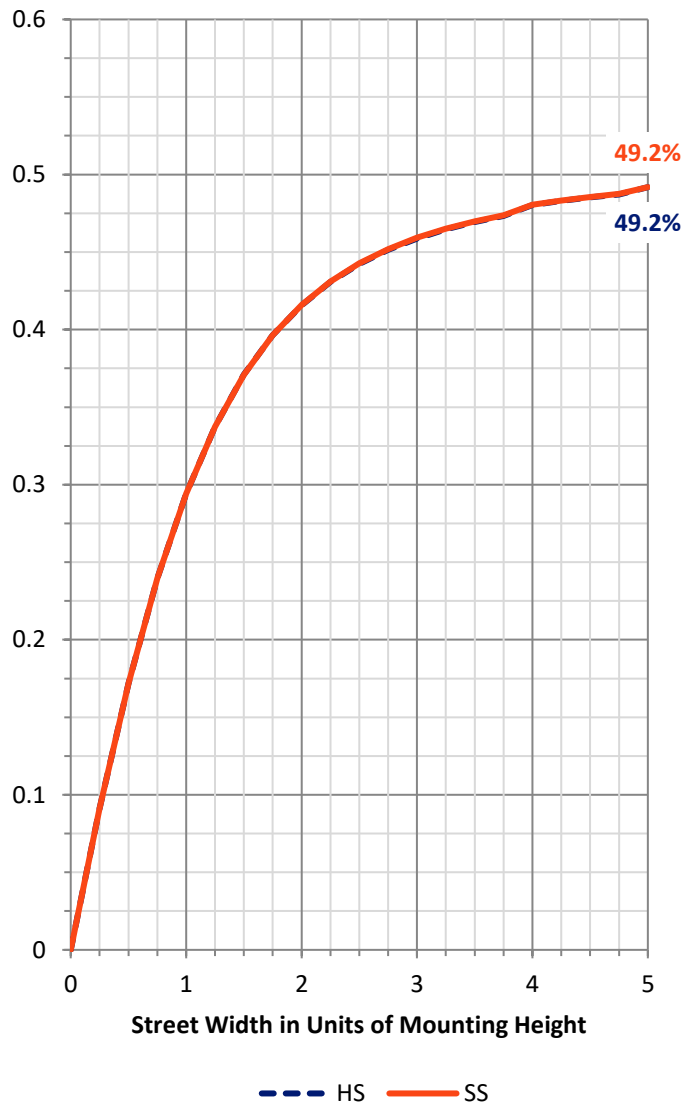
FLUX DISTRIBUTION:

		Downward	Upward	Total
House Side	Lumens	9412.3	0.0	9412.3
	% Fixture	50.0	0.0	50.0
Street Side	Lumens	9412.3	0.0	9412.3
	% Fixture	50.0	0.0	50.0
Total	Lumens	18824.6	0.0	18824.6
	% Fixture	100.0	0.0	100.0

Coefficient of Utilization

ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	357.5	1.9
10°-20°	1024.7	5.4
20°-30°	1646.7	8.7
30°-40°	2232.2	11.9
40°-50°	2850.8	15.1
50°-60°	3553.4	18.9
60°-70°	3620.8	19.2
70°-80°	2682.9	14.3
80°-90°	855.5	4.5
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°-90°	18824.6	100.0
0°-180°	18824.6	100.0

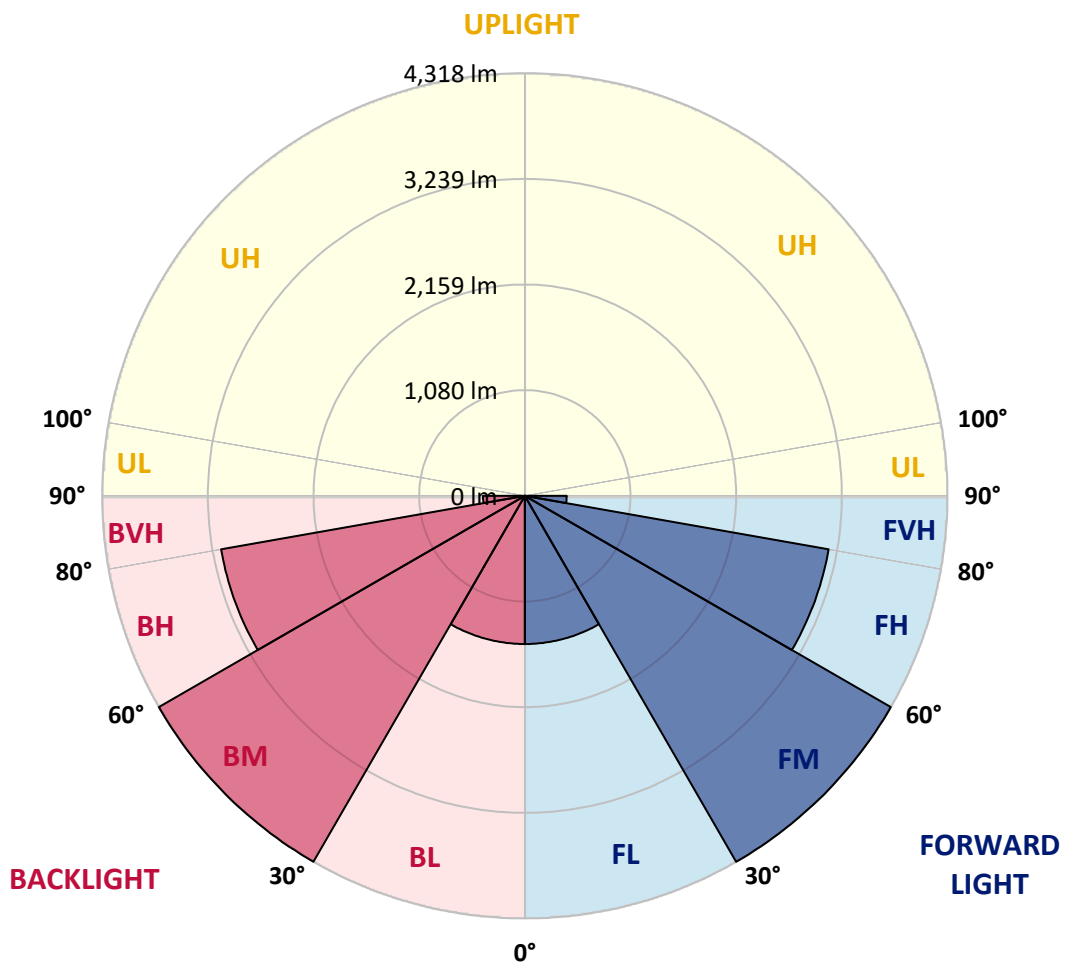


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

Zone		Lumens	% Fixture	Zone Rating/Lumen Limit		
				B	U	G
FL	(0°-30°)	1514.5	8.0			
FM	(30°-60°)	4318.2	22.9			
FH	(60°-80°)	3151.9	16.7			G2/5000
FVH	(80°-90°)	427.8	2.3			G3/500
BL	(0°-30°)	1514.5	8.0	B3/2500		
BM	(30°-60°)	4318.2	22.9	B3/5000		
BH	(60°-80°)	3151.9	16.7	B4/5000		G2/5000
BVH	(80°-90°)	427.8	2.3			G3/500
UL	(90°-100°)	0.0	0.0		U0/0	
UH	(100°-180°)	0.0	0.0		U0/0	

BUG Rating: B4-U0-G3
 Type V Short





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CATALOG NUMBER: EMM2-HSN-VA9-730-U-MQ

CANDELA DISTRIBUTION (FULL):

	0°	5°	15°	25°	35°	45°	55°	65°	75°	85°	90°
0°	3808.1	3808.1	3808.1	3808.1	3808.1	3808.1	3808.1	3808.1	3808.1	3808.1	3808.1
2.5°	3801.6	3801.6	3800.6	3800.6	3799.7	3800.6	3801.6	3801.6	3800.6	3799.7	3798.7
5°	3774.4	3775.3	3775.3	3773.4	3771.6	3771.6	3771.6	3772.5	3770.6	3771.6	3770.6
7.5°	3735.0	3732.2	3735.0	3734.1	3735.0	3732.2	3736.9	3735.0	3732.2	3734.1	3734.1
10°	3691.0	3691.9	3692.9	3691.9	3694.7	3693.8	3692.9	3691.9	3690.1	3691.9	3689.1
12.5°	3649.8	3650.7	3653.5	3654.4	3657.3	3656.3	3657.3	3655.4	3654.4	3650.7	3649.8
15°	3610.4	3612.3	3616.0	3618.8	3621.6	3622.6	3620.7	3619.8	3615.1	3612.3	3610.4
17.5°	3577.6	3577.6	3583.2	3587.9	3592.6	3593.5	3592.6	3587.9	3581.4	3574.8	3575.7
20°	3555.1	3555.1	3561.7	3569.2	3575.7	3577.6	3574.8	3566.4	3556.1	3551.4	3550.4
22.5°	3544.8	3545.7	3552.3	3560.7	3570.1	3572.0	3566.4	3556.1	3544.8	3536.4	3535.4
25°	3545.7	3543.9	3549.5	3562.6	3572.9	3574.8	3570.1	3556.1	3542.9	3535.4	3532.6
27.5°	3542.9	3543.9	3550.4	3563.6	3576.7	3580.4	3572.9	3556.1	3538.3	3531.7	3529.8
30°	3542.0	3542.9	3544.8	3566.4	3581.4	3587.9	3576.7	3554.2	3539.2	3528.9	3527.9
32.5°	3538.3	3533.6	3546.7	3559.8	3578.5	3587.0	3575.7	3555.1	3530.8	3523.3	3519.5
35°	3523.3	3527.9	3539.2	3561.7	3583.2	3588.9	3575.7	3550.4	3528.9	3513.9	3513.0
37.5°	3520.4	3520.4	3538.3	3561.7	3583.2	3591.7	3580.4	3552.3	3522.3	3503.6	3503.6
40°	3516.7	3515.8	3539.2	3568.2	3596.3	3607.6	3592.6	3557.9	3521.4	3503.6	3494.2
42.5°	3527.0	3532.6	3559.8	3602.0	3637.6	3656.3	3634.8	3596.3	3553.2	3519.5	3518.6
45°	3575.7	3587.9	3616.0	3687.2	3735.0	3757.5	3732.2	3665.7	3598.2	3553.2	3550.4
47.5°	3651.6	3647.9	3714.4	3789.4	3859.7	3884.0	3847.5	3769.7	3672.2	3617.9	3603.8
50°	3704.1	3713.5	3781.9	3890.6	3995.5	4023.6	3970.2	3870.0	3764.1	3689.1	3676.0
52.5°	3775.3	3777.2	3864.3	4002.1	4109.8	4140.8	4089.2	3964.6	3822.2	3728.5	3721.9
55°	3783.8	3814.7	3920.6	4070.5	4199.8	4236.3	4172.6	4039.6	3873.7	3757.5	3746.3
57.5°	3777.2	3767.8	3896.2	4068.6	4190.4	4242.0	4179.2	4032.1	3854.0	3731.3	3701.3
60°	3642.3	3681.6	3823.1	3991.8	4148.3	4199.8	4126.7	3976.8	3781.9	3646.9	3634.8
62.5°	3550.4	3567.3	3696.6	3923.4	4051.7	4103.3	4047.1	3870.9	3662.9	3522.3	3505.5
65°	3407.1	3420.2	3572.0	3758.5	3937.4	3983.3	3911.2	3763.1	3540.1	3385.5	3354.6
67.5°	3178.4	3214.0	3364.0	3601.0	3724.7	3803.4	3738.8	3530.8	3328.4	3176.6	3154.1
70°	2912.3	2960.1	3114.7	3308.7	3514.8	3554.2	3465.2	3323.7	3096.9	2934.8	2895.4
72.5°	2655.6	2659.3	2803.6	3031.3	3161.6	3234.7	3184.1	2997.6	2775.5	2637.8	2613.4
75°	2296.7	2297.6	2456.0	2642.4	2807.4	2855.2	2774.6	2643.4	2445.7	2291.1	2276.1
77.5°	1880.6	1905.9	2046.5	2226.4	2356.6	2426.0	2368.8	2220.8	2036.2	1904.1	1889.1
80°	1474.9	1506.8	1606.1	1767.3	1879.7	1940.6	1878.8	1749.4	1608.9	1479.6	1481.5
82.5°	1041.0	1064.5	1158.2	1267.8	1377.4	1422.4	1396.2	1300.6	1172.2	1058.9	1027.9
85°	581.0	610.9	673.7	770.2	843.3	901.4	868.6	793.7	682.2	610.9	609.1
87.5°	170.5	184.6	209.9	274.6	343.9	369.2	361.7	343.0	300.8	269.9	250.2
90°	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-20

Test Date: 10/23/2024

Luminaire Tested: MEM2-HTN-VA-150-740-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-150-740-U-WQ

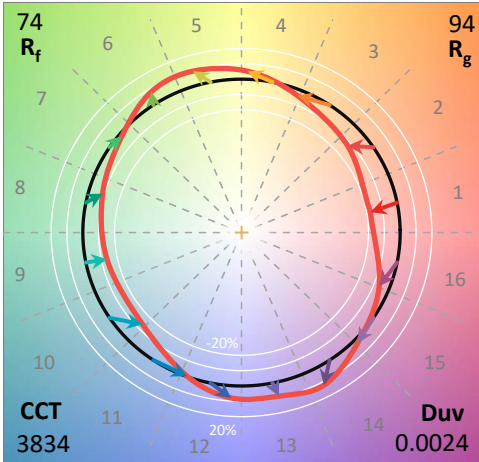
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-176-20
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/23/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-VA-150-740-U-WQ**
 Description: EPIC MODERN VISUAL COMFORT 150W WAVESTREAM WIDE

Spectral Parameters

CCT (K): 3834
 CIE u': 0.2270
 CIE v': 0.5077
 Duv: 0.0024
 CIE x: 0.3900
 CIE y: 0.3877
 CIE z: 0.2223
 Peak Wavelength (nm): 585
 Dominant Wavelength (nm): 578
 Purity: 33.41599
 Rf: 74.4
 Rg: 93.6

CRI (Ra):	71.3		
R1:	67.4	R9:	-37.8
R2:	78.6	R10:	50.1
R3:	88.2	R11:	65.6
R4:	70.0	R12:	44.1
R5:	67.5	R13:	69.2
R6:	70.1	R14:	93.3
R7:	80.0	R15:	59.4
R8:	48.5		



Test Conditions

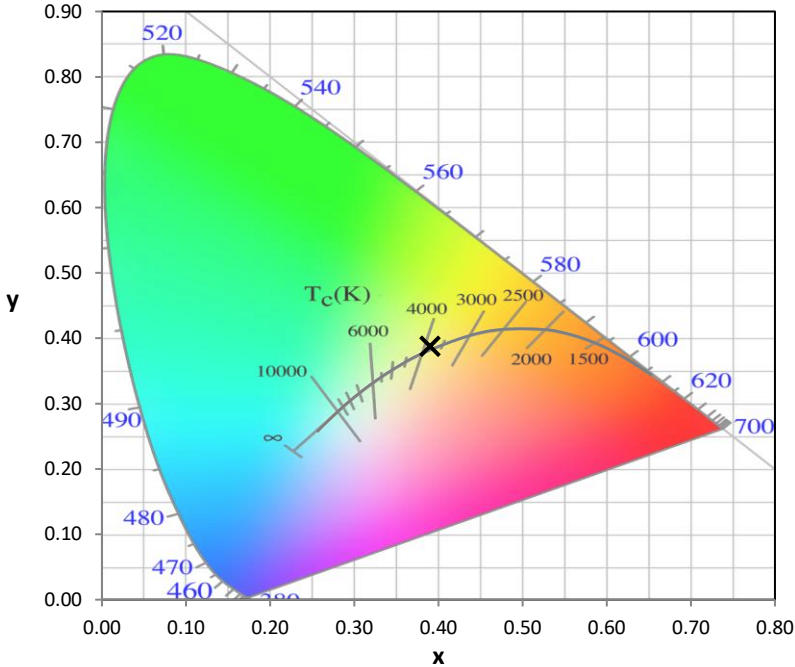
Stabilization Time: 30M
 Operation Time: 1H 30M
 Sphere Temperature (°C): 25.1

REPORT NUMBER: SP1-2407-176-20

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	IN0058	6/18/2024	12/18/2024
Power Meter	INXT2011004	2/8/2024	2/8/2025
AC Power Source	IN0063	10/22/2024	10/22/2025
DC Power Source	IN0208	10/22/2024	10/22/2025
Sphere Thermometer	IN0085	10/22/2024	10/22/2025
Room Thermometer	IN0046	10/22/2024	10/22/2025

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CIE 1931 Chromaticity Diagram



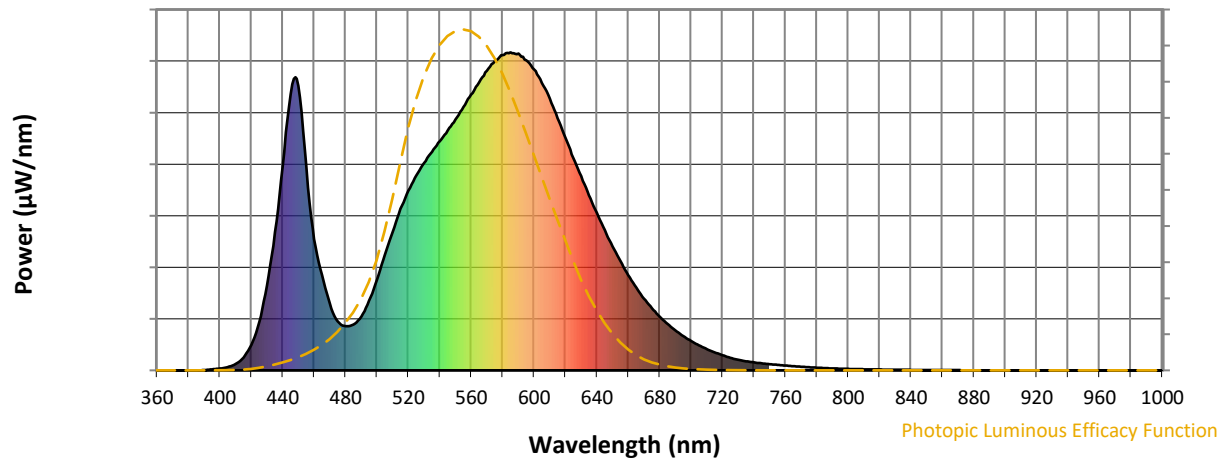
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 4000K 4-step quadrangle

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Photopic Flux vs. Wavelength



Photopic Lumens: NR

λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	NR	630	611	NR	760	15	NR	890	0	NR
375	0	NR	505	362	NR	635	550	NR	765	13	NR	895	0	NR
380	0	NR	510	435	NR	640	495	NR	770	11	NR	900	0	NR
385	0	NR	515	508	NR	645	440	NR	775	10	NR	905	0	NR
390	1	NR	520	565	NR	650	390	NR	780	8	NR	910	0	NR
395	3	NR	525	612	NR	655	343	NR	785	7	NR	915	0	NR
400	6	NR	530	652	NR	660	299	NR	790	6	NR	920	0	NR
405	10	NR	535	687	NR	665	261	NR	795	5	NR	925	0	NR
410	20	NR	540	720	NR	670	226	NR	800	5	NR	930	0	NR
415	40	NR	545	755	NR	675	195	NR	805	4	NR	935	0	NR
420	80	NR	550	789	NR	680	169	NR	810	3	NR	940	0	NR
425	152	NR	555	828	NR	685	146	NR	815	3	NR	945	0	NR
430	266	NR	560	867	NR	690	126	NR	820	3	NR	950	0	NR
435	435	NR	565	905	NR	695	108	NR	825	2	NR	955	0	NR
440	641	NR	570	942	NR	700	92	NR	830	2	NR	960	0	NR
445	869	NR	575	972	NR	705	79	NR	835	2	NR	965	0	NR
450	894	NR	580	991	NR	710	67	NR	840	2	NR	970	0	NR
455	640	NR	585	1000	NR	715	56	NR	845	1	NR	975	0	NR
460	413	NR	590	996	NR	720	47	NR	850	1	NR	980	0	NR
465	300	NR	595	975	NR	725	40	NR	855	1	NR	985	0	NR
470	208	NR	600	946	NR	730	33	NR	860	1	NR	990	0	NR
475	154	NR	605	903	NR	735	29	NR	865	1	NR	995	0	NR
480	139	NR	610	854	NR	740	25	NR	870	1	NR	1000	0	NR
485	144	NR	615	793	NR	745	22	NR	875	0	NR			

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Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.47

λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)	λ (nm)	Power W [^] /nm	Lumens (ϕ /nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	NR	630	611	NR	760	15	NR	890	0	NR
375	0	NR	505	362	NR	635	550	NR	765	13	NR	895	0	NR
380	0	NR	510	435	NR	640	495	NR	770	11	NR	900	0	NR
385	0	NR	515	508	NR	645	440	NR	775	10	NR	905	0	NR
390	1	NR	520	565	NR	650	390	NR	780	8	NR	910	0	NR
395	3	NR	525	612	NR	655	343	NR	785	7	NR	915	0	NR
400	6	NR	530	652	NR	660	299	NR	790	6	NR	920	0	NR
405	10	NR	535	687	NR	665	261	NR	795	5	NR	925	0	NR
410	20	NR	540	720	NR	670	226	NR	800	5	NR	930	0	NR
415	40	NR	545	755	NR	675	195	NR	805	4	NR	935	0	NR
420	80	NR	550	789	NR	680	169	NR	810	3	NR	940	0	NR
425	152	NR	555	828	NR	685	146	NR	815	3	NR	945	0	NR
430	266	NR	560	867	NR	690	126	NR	820	3	NR	950	0	NR
435	435	NR	565	905	NR	695	108	NR	825	2	NR	955	0	NR
440	641	NR	570	942	NR	700	92	NR	830	2	NR	960	0	NR
445	869	NR	575	972	NR	705	79	NR	835	2	NR	965	0	NR
450	894	NR	580	991	NR	710	67	NR	840	2	NR	970	0	NR
455	640	NR	585	1000	NR	715	56	NR	845	1	NR	975	0	NR
460	413	NR	590	996	NR	720	47	NR	850	1	NR	980	0	NR
465	300	NR	595	975	NR	725	40	NR	855	1	NR	985	0	NR
470	208	NR	600	946	NR	730	33	NR	860	1	NR	990	0	NR
475	154	NR	605	903	NR	735	29	NR	865	1	NR	995	0	NR
480	139	NR	610	854	NR	740	25	NR	870	1	NR	1000	0	NR
485	144	NR	615	793	NR	745	22	NR	875	0	NR			

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Melanopic Flux vs. Wavelength



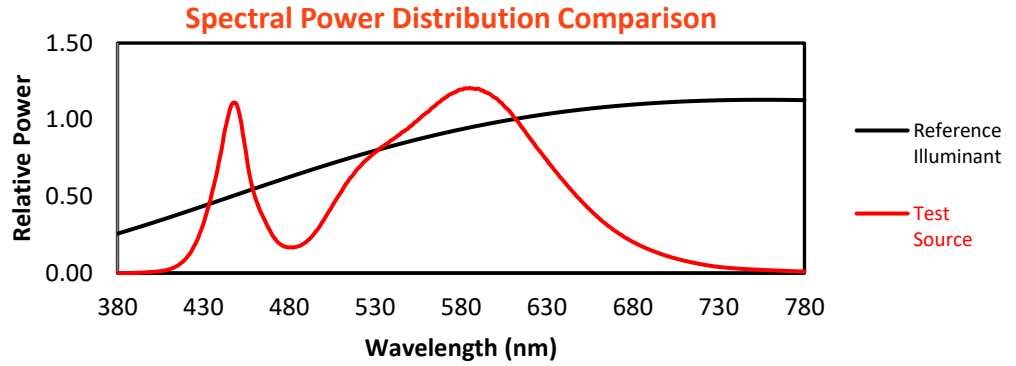
Melanopic Lumens: NR

M/P: 2.83

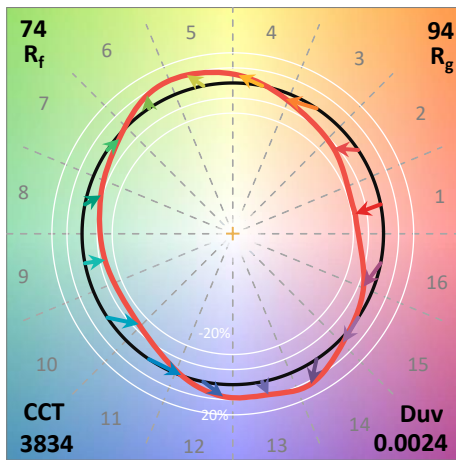
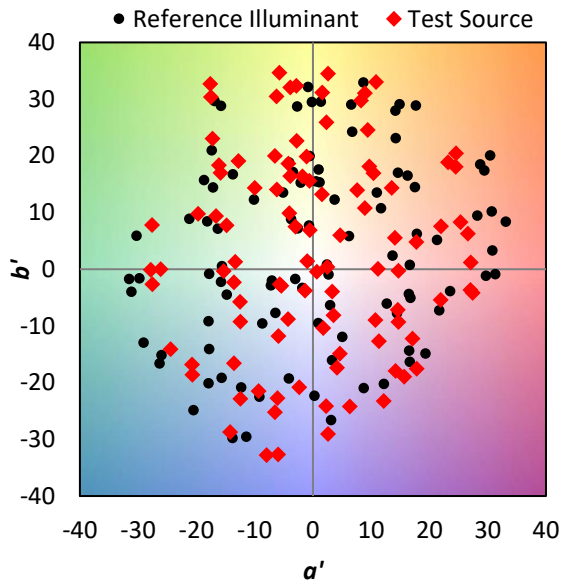
λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)	λ (nm)	Power W [^] /nm	Lumens (φ/nm)
360	0	NR	490	169	NR	620	731	NR	750	20	NR	880	0	NR
365	0	NR	495	219	NR	625	668	NR	755	17	NR	885	0	NR
370	0	NR	500	285	NR	630	611	NR	760	15	NR	890	0	NR
375	0	NR	505	362	NR	635	550	NR	765	13	NR	895	0	NR
380	0	NR	510	435	NR	640	495	NR	770	11	NR	900	0	NR
385	0	NR	515	508	NR	645	440	NR	775	10	NR	905	0	NR
390	1	NR	520	565	NR	650	390	NR	780	8	NR	910	0	NR
395	3	NR	525	612	NR	655	343	NR	785	7	NR	915	0	NR
400	6	NR	530	652	NR	660	299	NR	790	6	NR	920	0	NR
405	10	NR	535	687	NR	665	261	NR	795	5	NR	925	0	NR
410	20	NR	540	720	NR	670	226	NR	800	5	NR	930	0	NR
415	40	NR	545	755	NR	675	195	NR	805	4	NR	935	0	NR
420	80	NR	550	789	NR	680	169	NR	810	3	NR	940	0	NR
425	152	NR	555	828	NR	685	146	NR	815	3	NR	945	0	NR
430	266	NR	560	867	NR	690	126	NR	820	3	NR	950	0	NR
435	435	NR	565	905	NR	695	108	NR	825	2	NR	955	0	NR
440	641	NR	570	942	NR	700	92	NR	830	2	NR	960	0	NR
445	869	NR	575	972	NR	705	79	NR	835	2	NR	965	0	NR
450	894	NR	580	991	NR	710	67	NR	840	2	NR	970	0	NR
455	640	NR	585	1000	NR	715	56	NR	845	1	NR	975	0	NR
460	413	NR	590	996	NR	720	47	NR	850	1	NR	980	0	NR
465	300	NR	595	975	NR	725	40	NR	855	1	NR	985	0	NR
470	208	NR	600	946	NR	730	33	NR	860	1	NR	990	0	NR
475	154	NR	605	903	NR	735	29	NR	865	1	NR	995	0	NR
480	139	NR	610	854	NR	740	25	NR	870	1	NR	1000	0	NR
485	144	NR	615	793	NR	745	22	NR	875	0	NR			

Summary

$R_f = 74.4$
 $R_g = 93.6$
 $CIE R_a = 71.3$
 $R_g = -37.8$

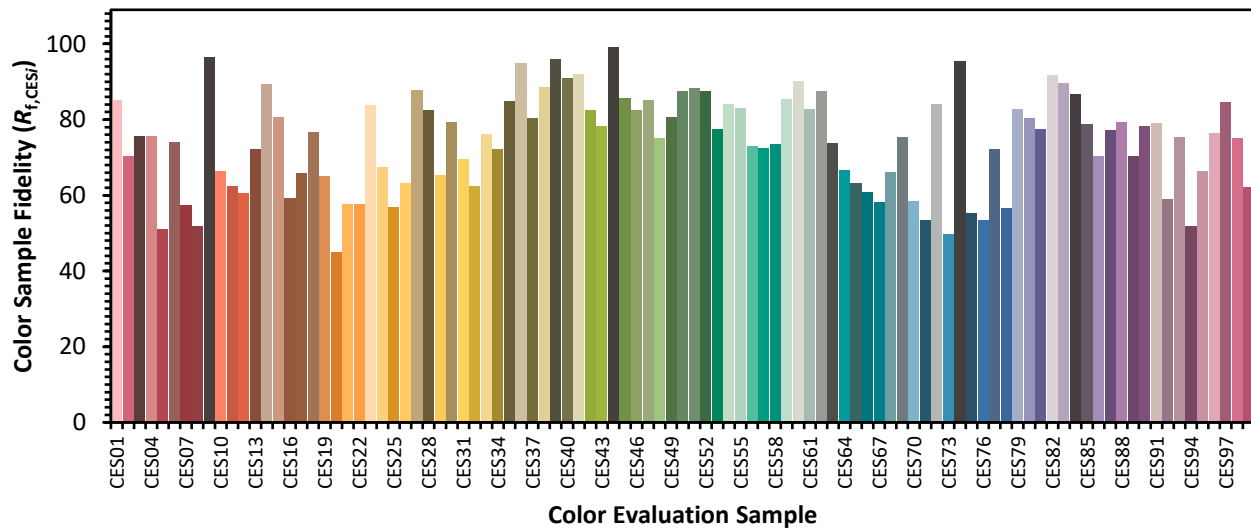


Color Vector Graphics

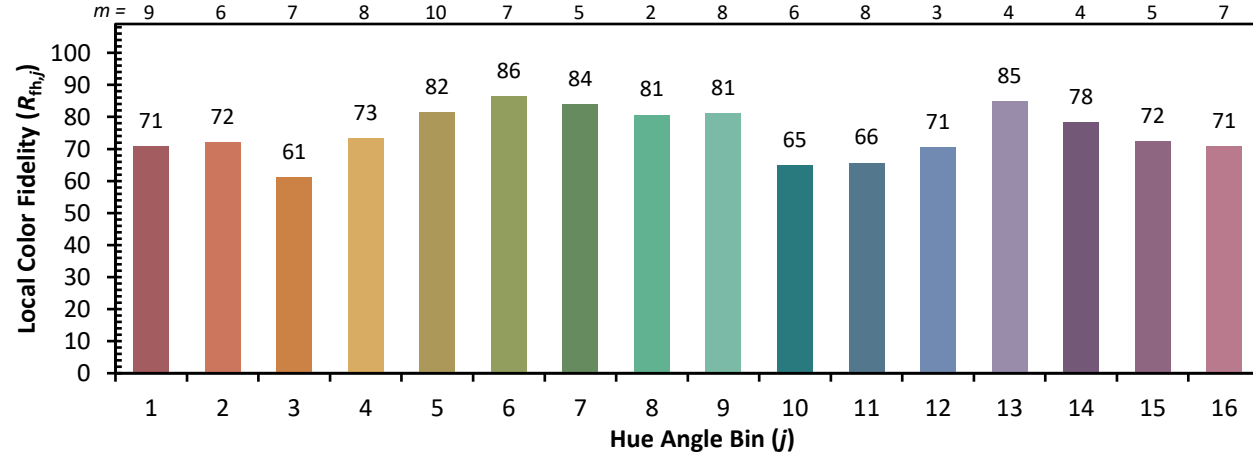


Individual Sample Fidelity Index ($R_{f,i}$)

CES01 = 85	CES26 = 63	CES51 = 88	CES76 = 54
CES02 = 61	CES27 = 88	CES52 = 87	CES77 = 72
CES03 = 30	CES28 = 83	CES53 = 77	CES78 = 57
CES04 = 70	CES29 = 65	CES54 = 84	CES79 = 83
CES05 = 47	CES30 = 79	CES55 = 83	CES80 = 80
CES06 = 50	CES31 = 69	CES56 = 73	CES81 = 78
CES07 = 40	CES32 = 62	CES57 = 72	CES82 = 92
CES08 = 39	CES33 = 76	CES58 = 74	CES83 = 90
CES09 = 29	CES34 = 72	CES59 = 85	CES84 = 87
CES10 = 74	CES35 = 85	CES60 = 90	CES85 = 79
CES11 = 57	CES36 = 95	CES61 = 83	CES86 = 70
CES12 = 63	CES37 = 80	CES62 = 88	CES87 = 77
CES13 = 42	CES38 = 89	CES63 = 74	CES88 = 79
CES14 = 74	CES39 = 96	CES64 = 67	CES89 = 70
CES15 = 71	CES40 = 91	CES65 = 63	CES90 = 78
CES16 = 46	CES41 = 92	CES66 = 61	CES91 = 79
CES17 = 49	CES42 = 83	CES67 = 58	CES92 = 59
CES18 = 56	CES43 = 78	CES68 = 66	CES93 = 75
CES19 = 72	CES44 = 99	CES69 = 75	CES94 = 52
CES20 = 65	CES45 = 86	CES70 = 59	CES95 = 67
CES21 = 86	CES46 = 82	CES71 = 54	CES96 = 76
CES22 = 78	CES47 = 85	CES72 = 84	CES97 = 85
CES23 = 92	CES48 = 75	CES73 = 50	CES98 = 75
CES24 = 91	CES49 = 81	CES74 = 96	CES99 = 62
CES25 = 72	CES50 = 88	CES75 = 55	



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)