

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: METALUX

Report Number: P828270

Luminaire Tested: **OHBL-15HE-MCL-UNV-L940-CD-UPL24**

Issue Date: 5/3/2024



Test Information

Test Method: LM-79-08
Report Number: P828270
REPORT IS A COMBINATION OF REPORTS P826216 AND G3-2310-221-6
Test Lab: INNOVATION CENTER
Issue Date: 5/3/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: OHBL-15HE-MCL-UNV-L940-CD-UPL24
Description:
Light Source: -
Ballast/Driver: -

Summary

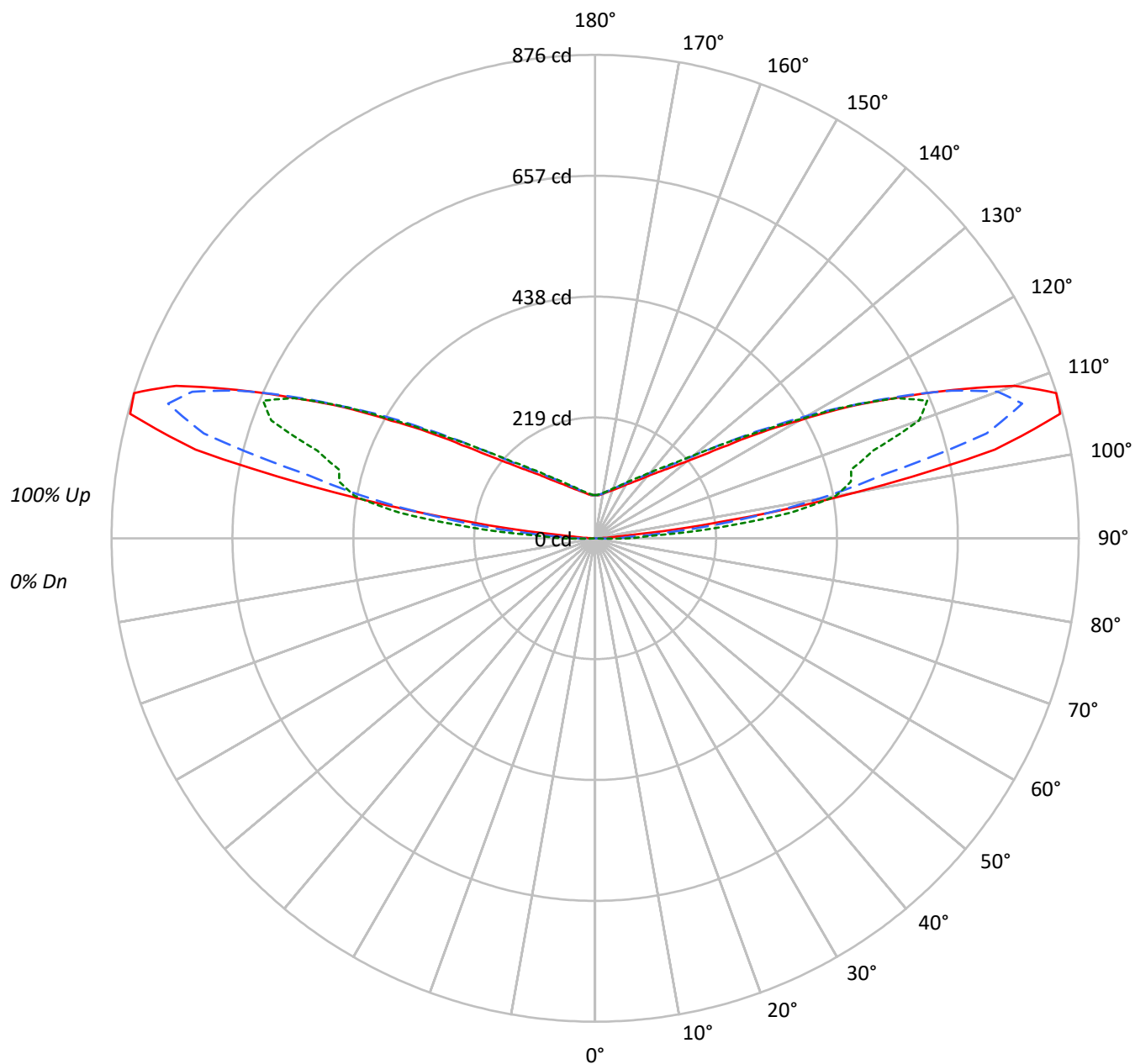
Lumens per Lamp: N/A
Luminaire Lumens: 2104.3 lumens
Efficiency: N/A
Efficacy: 120.9 lumens/watt
Spacing Criteria (0/90/45): - / - / -
Luminous Opening: Rectangular w/ Sides (W: 3.78' x L: 1.67' x H: 0.17')
CIE Type: Indirect

Input Watts (W): 17.4
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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CATALOG NUMBER: OHBL-15HE-MCL-UNV-L940-CD-UPL24

Luminous Intensity Polar Plot





TEST NUMBER: P828270

CATALOG NUMBER: OHBL-15HE-MCL-UNV-L940-CD-UPL24

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20					20					20					20
RC	80				70					50					30					10
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10
RCR																				
0	95	95	95	95	81	81	81	81	56	56	56	32	32	32	10	10	10	10	10	10
1	87	83	79	76	74	71	68	65	48	47	45	28	27	26	9	9	9	9	9	9
2	79	72	66	62	67	62	57	53	42	40	37	24	23	22	8	7	7	7	7	7
3	72	63	56	51	61	54	49	44	37	34	31	21	20	18	7	6	6	6	6	6
4	65	56	48	43	56	48	42	37	33	29	26	19	17	16	6	6	5	5	5	5
5	60	49	42	36	51	42	36	32	29	25	22	17	15	13	5	5	4	4	4	4
6	55	44	36	31	47	38	31	27	26	22	19	15	13	11	5	4	4	4	4	4
7	50	39	32	27	43	34	28	23	23	19	17	14	11	10	4	4	3	3	3	3
8	47	35	28	23	40	30	24	20	21	17	14	12	10	9	4	3	3	3	3	3
9	43	32	25	20	37	27	22	18	19	15	13	11	9	8	4	3	2	2	2	2
10	40	29	22	18	34	25	19	16	17	14	11	10	8	7	3	3	2	2	2	2

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	0	0	0
5°	0	0	0
10°	0	0	0
15°	0	0	0
20°	0	0	0
25°	0	0	0
30°	0	0	0
35°	0	0	0
40°	0	0	0
45°	0	0	0
50°	0	0	0
55°	0	0	0
60°	0	0	0
65°	0	0	0
70°	0	0	0
75°	0	0	0
80°	0	0	0
85°	0	0	0



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ZONAL LUMENS:

Zone	Lumens	% Fixture
0°-10°	0.0	0.0
10°-20°	0.0	0.0
20°-30°	0.0	0.0
30°-40°	0.0	0.0
40°-50°	0.0	0.0
50°-60°	0.0	0.0
60°-70°	0.0	0.0
70°-80°	0.0	0.0
80°-90°	5.4	0.3
90°-100°	201.6	9.6
100°-110°	699.8	33.3
110°-120°	600.3	28.5
120°-130°	288.0	13.7
130°-140°	144.1	6.8
140°-150°	83.5	4.0
150°-160°	48.7	2.3
160°-170°	25.2	1.2
170°-180°	7.7	0.4
0°-30°	0.0	0.0
0°-40°	0.0	0.0
0°-60°	0.0	0.0
0°-90°	5.4	0.3
90°-120°	1501.7	71.4
90°-150°	2017.3	95.9
90°-180°	2099.0	99.7
0°-180°	2104.3	100.0

CANDELA DISTRIBUTION:

	0°	22.5°	45°	67.5°	90°	Flux
0°	0	0	0	0	0	
5°	0	0	0	0	0	0
15°	0	0	0	0	0	0
25°	0	0	0	0	0	0
35°	0	0	0	0	0	0
45°	0	0	0	0	0	0
55°	0	0	0	0	0	0
65°	0	0	0	0	0	0
75°	0	0	0	0	0	0
85°	0	0	0	0	0	0
90°	4	30	41	54	60	3
95°	46	96	150	198	224	143
105°	872	862	734	522	480	827
115°	602	608	608	606	601	607
125°	294	310	316	315	312	276
135°	174	177	184	185	187	137
145°	126	130	132	133	134	80
155°	101	103	104	105	105	47
165°	87	88	89	89	89	25
175°	78	79	79	80	80	8
180°	78	78	78	78	78	



TEST NUMBER: P828270

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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	0.0	0.0	0.0	0.0	0.0
2.5°	0.0	0.0	0.0	0.0	0.0
5°	0.0	0.0	0.0	0.0	0.0
7.5°	0.0	0.0	0.0	0.0	0.0
10°	0.0	0.0	0.0	0.0	0.0
12.5°	0.0	0.0	0.0	0.0	0.0
15°	0.0	0.0	0.0	0.0	0.0
17.5°	0.0	0.0	0.0	0.0	0.0
20°	0.0	0.0	0.0	0.0	0.0
22.5°	0.0	0.0	0.0	0.0	0.0
25°	0.0	0.0	0.0	0.0	0.0
27.5°	0.0	0.0	0.0	0.0	0.0
30°	0.0	0.0	0.0	0.0	0.0
32.5°	0.0	0.0	0.0	0.0	0.0
35°	0.0	0.0	0.0	0.0	0.0
37.5°	0.0	0.0	0.0	0.0	0.0
40°	0.0	0.0	0.0	0.0	0.0
42.5°	0.0	0.0	0.0	0.0	0.0
45°	0.0	0.0	0.0	0.0	0.0
47.5°	0.0	0.0	0.0	0.0	0.0
50°	0.0	0.0	0.0	0.0	0.0
52.5°	0.0	0.0	0.0	0.0	0.0
55°	0.0	0.0	0.0	0.0	0.0
57.5°	0.0	0.0	0.0	0.0	0.0
60°	0.0	0.0	0.0	0.0	0.0
62.5°	0.0	0.0	0.0	0.0	0.0
65°	0.0	0.0	0.0	0.0	0.0
67.5°	0.0	0.0	0.0	0.0	0.0
70°	0.0	0.0	0.0	0.0	0.0
72.5°	0.0	0.0	0.0	0.0	0.0
75°	0.0	0.0	0.0	0.0	0.0
77.5°	0.0	0.0	0.0	0.0	0.0
80°	0.0	0.0	0.0	0.0	0.0
82.5°	0.0	0.0	0.0	0.0	0.0
85°	0.0	0.0	0.0	0.0	0.0
87.5°	0.0	0.0	0.0	0.0	0.0
90°	4.3	29.6	40.9	53.9	60.0
92.5°	14.8	39.1	62.6	88.7	100.0
95°	46.1	96.5	149.5	198.2	224.3
97.5°	233.9	253.0	272.1	329.5	358.2
100°	479.9	509.5	411.2	434.7	442.5
102.5°	741.6	737.3	537.3	481.7	474.7
105°	872.1	862.5	733.8	522.5	479.9



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CATALOG NUMBER: OHBL-15HE-MCL-UNV-L940-CD-UPL24

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	702.5	712.9	699.0	679.0	651.2
115°	601.7	607.7	607.7	606.0	600.8
117.5°	514.7	515.6	519.1	518.2	519.1
120°	426.0	435.6	443.4	439.1	433.9
122.5°	357.3	367.8	373.0	371.3	366.0
125°	293.9	309.5	315.6	314.7	312.1
127.5°	248.7	260.0	268.7	269.5	268.7
130°	216.5	223.4	232.1	233.0	233.9
132.5°	192.1	198.2	204.3	207.8	206.9
135°	173.9	177.4	183.5	185.2	186.9
137.5°	159.1	161.7	166.9	169.5	169.5
140°	146.1	149.5	153.9	155.6	156.5
142.5°	134.8	138.2	141.7	143.5	143.5
145°	126.1	129.5	132.2	133.0	133.9
147.5°	118.2	121.7	123.5	125.2	125.2
150°	112.2	113.9	116.5	117.4	118.2
152.5°	106.1	107.8	110.4	111.3	111.3
155°	100.9	102.6	104.3	105.2	105.2
157.5°	96.5	98.2	100.0	100.9	100.9
160°	93.0	93.9	95.6	96.5	96.5
162.5°	89.6	90.4	91.3	92.2	92.2
165°	86.9	87.8	88.7	88.7	88.7
167.5°	84.3	84.3	85.2	86.1	86.1
170°	81.7	82.6	82.6	83.5	83.5
172.5°	80.0	80.9	80.9	80.9	81.7
175°	78.2	79.1	79.1	80.0	80.0
177.5°	78.2	78.2	78.2	78.2	78.2
180°	78.2	78.2	78.2	78.2	78.2



Report Generated By 670246072 / DESKTOP-50001EG





— 0°-180° - - 45°-225° - - - 90°-270°







107.5°	875.5	879.0	811.2	633.8	527.8
110°	807.7	815.5	776.4	709.5	624.3



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

Report Prepared for

Cooper Lighting Solutions

METALUX

Report Number: SP1-2307-100-8

Test Date: 08/01/2023

Luminaire Tested: OHB-15SE-N-UNV-L940-CD

Data in this report applies to families of products including OHB-15SE-N-UNV-L940-CD.

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2307-100-8
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/04/2023
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: METALUX
 Catalog Number: **OHB-15SE-N-UNV-L940-CD**
 Description: 15000 LUMEN OHB SE LED LUMINAIRE WITH 90CRI, 4000K LEDS AND NARROW LENS

LENS

Spectral Parameters

CCT (K):	3979	CRI (Ra):	91.5		
CIE u':	0.2254	R1:	91.7	R9:	57.0
CIE v':	0.5020	R2:	96.4	R10:	89.6
Duv:	0.0001	R3:	97.6	R11:	89.1
CIE x:	0.3813	R4:	89.2	R12:	69.6
CIE y:	0.3773	R5:	90.3	R13:	93.4
CIE z:	0.2414	R6:	93.0	R14:	98.9
Peak Wavelength (nm):	455	R7:	91.6		
Dominant Wavelength (nm):	579	R8:	81.9		
Purity:	27.8				
Rf:	88.6				
Rg:	96.2				



Test Conditions

Stabilization Time: 23M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.7/57%
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2307-100-8

Measurement and Test Equipment			
Instrument	Identification Number	Calibration Date	Calibration Due Date
Photometer	76INCH SPHERE IN0058	2/9/2023	8/9/2023
Power Meter	XITRON 2801 IN0071	11/29/2022	11/29/2023
AC Power Source	CHROMA 61603 IN0063	11/28/2022	11/28/2023
DC Power Source	AGILENT E3634A IN0208	11/28/2022	11/28/2023
Sphere Thermometer	ONSET IN0085	11/28/2022	11/28/2023
Room Thermometer	ONSET IN0046	11/28/2022	11/28/2023

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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



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λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	6299	NR	490	95290	NR	620	202945	NR	750	17048	NR	880	6802	NR
365	5178	NR	495	104168	NR	625	198934	NR	755	15396	NR	885	7389	NR
370	5490	NR	500	113725	NR	630	192455	NR	760	13359	NR	890	5235	NR
375	6104	NR	505	126034	NR	635	185651	NR	765	12573	NR	895	4778	NR
380	6149	NR	510	134848	NR	640	177659	NR	770	10940	NR	900	5847	NR
385	5688	NR	515	142720	NR	645	169230	NR	775	9589	NR	905	5969	NR
390	5262	NR	520	149276	NR	650	157607	NR	780	8802	NR	910	6399	NR
395	4581	NR	525	154675	NR	655	148474	NR	785	8257	NR	915	5912	NR
400	4118	NR	530	159852	NR	660	137175	NR	790	7397	NR	920	6048	NR
405	4084	NR	535	164319	NR	665	125124	NR	795	7591	NR	925	5552	NR
410	4438	NR	540	169099	NR	670	113759	NR	800	7116	NR	930	7244	NR
415	5782	NR	545	173030	NR	675	102656	NR	805	6905	NR	935	6076	NR
420	8737	NR	550	175415	NR	680	92651	NR	810	6711	NR	940	6581	NR
425	14203	NR	555	179385	NR	685	82728	NR	815	6202	NR	945	7094	NR
430	23287	NR	560	183651	NR	690	72755	NR	820	6421	NR	950	6374	NR
435	39198	NR	565	186704	NR	695	64864	NR	825	6067	NR	955	5408	NR
440	65090	NR	570	189735	NR	700	57132	NR	830	6507	NR	960	5406	NR
445	111800	NR	575	192391	NR	705	50899	NR	835	6304	NR	965	5676	NR
450	185327	NR	580	195587	NR	710	44715	NR	840	5605	NR	970	6132	NR
455	231910	NR	585	198690	NR	715	39661	NR	845	5975	NR	975	7732	NR
460	199850	NR	590	200528	NR	720	35220	NR	850	5252	NR	980	4497	NR
465	159032	NR	595	204245	NR	725	31033	NR	855	6570	NR	985	1796	NR
470	134681	NR	600	206961	NR	730	27573	NR	860	6167	NR	990	6719	NR
475	109873	NR	605	207509	NR	735	24077	NR	865	5558	NR	995	10730	NR
480	92595	NR	610	206751	NR	740	21375	NR	870	5280	NR	1000	10317	NR
485	90323	NR	615	205233	NR	745	19152	NR	875	5889	NR			

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 22729.8

S/P: 1.79

λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)	λ (nm)	Power (μW/nm)	Lumens (φ/nm)
360	6299	NR	490	95290	NR	620	202945	NR	750	17048	NR	880	6802	NR
365	5178	NR	495	104168	NR	625	198934	NR	755	15396	NR	885	7389	NR
370	5490	NR	500	113725	NR	630	192455	NR	760	13359	NR	890	5235	NR
375	6104	NR	505	126034	NR	635	185651	NR	765	12573	NR	895	4778	NR
380	6149	NR	510	134848	NR	640	177659	NR	770	10940	NR	900	5847	NR
385	5688	NR	515	142720	NR	645	169230	NR	775	9589	NR	905	5969	NR
390	5262	NR	520	149276	NR	650	157607	NR	780	8802	NR	910	6399	NR
395	4581	NR	525	154675	NR	655	148474	NR	785	8257	NR	915	5912	NR
400	4118	NR	530	159852	NR	660	137175	NR	790	7397	NR	920	6048	NR
405	4084	NR	535	164319	NR	665	125124	NR	795	7591	NR	925	5552	NR
410	4438	NR	540	169099	NR	670	113759	NR	800	7116	NR	930	7244	NR
415	5782	NR	545	173030	NR	675	102656	NR	805	6905	NR	935	6076	NR
420	8737	NR	550	175415	NR	680	92651	NR	810	6711	NR	940	6581	NR
425	14203	NR	555	179385	NR	685	82728	NR	815	6202	NR	945	7094	NR
430	23287	NR	560	183651	NR	690	72755	NR	820	6421	NR	950	6374	NR
435	39198	NR	565	186704	NR	695	64864	NR	825	6067	NR	955	5408	NR
440	65090	NR	570	189735	NR	700	57132	NR	830	6507	NR	960	5406	NR
445	111800	NR	575	192391	NR	705	50899	NR	835	6304	NR	965	5676	NR
450	185327	NR	580	195587	NR	710	44715	NR	840	5605	NR	970	6132	NR
455	231910	NR	585	198690	NR	715	39661	NR	845	5975	NR	975	7732	NR
460	199850	NR	590	200528	NR	720	35220	NR	850	5252	NR	980	4497	NR
465	159032	NR	595	204245	NR	725	31033	NR	855	6570	NR	985	1796	NR
470	134681	NR	600	206961	NR	730	27573	NR	860	6167	NR	990	6719	NR
475	109873	NR	605	207509	NR	735	24077	NR	865	5558	NR	995	10730	NR
480	92595	NR	610	206751	NR	740	21375	NR	870	5280	NR	1000	10317	NR
485	90323	NR	615	205233	NR	745	19152	NR	875	5889	NR			

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 9423.4 M/P: 0.74

λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (ϕ/nm)	λ (nm)	Power ($\mu\text{W/nm}$)	Lumens (ϕ/nm)
360	6299	NR	490	95290	NR	620	202945	NR	750	17048	NR	880	6802	NR
365	5178	NR	495	104168	NR	625	198934	NR	755	15396	NR	885	7389	NR
370	5490	NR	500	113725	NR	630	192455	NR	760	13359	NR	890	5235	NR
375	6104	NR	505	126034	NR	635	185651	NR	765	12573	NR	895	4778	NR
380	6149	NR	510	134848	NR	640	177659	NR	770	10940	NR	900	5847	NR
385	5688	NR	515	142720	NR	645	169230	NR	775	9589	NR	905	5969	NR
390	5262	NR	520	149276	NR	650	157607	NR	780	8802	NR	910	6399	NR
395	4581	NR	525	154675	NR	655	148474	NR	785	8257	NR	915	5912	NR
400	4118	NR	530	159852	NR	660	137175	NR	790	7397	NR	920	6048	NR
405	4084	NR	535	164319	NR	665	125124	NR	795	7591	NR	925	5552	NR
410	4438	NR	540	169099	NR	670	113759	NR	800	7116	NR	930	7244	NR
415	5782	NR	545	173030	NR	675	102656	NR	805	6905	NR	935	6076	NR
420	8737	NR	550	175415	NR	680	92651	NR	810	6711	NR	940	6581	NR
425	14203	NR	555	179385	NR	685	82728	NR	815	6202	NR	945	7094	NR
430	23287	NR	560	183651	NR	690	72755	NR	820	6421	NR	950	6374	NR
435	39198	NR	565	186704	NR	695	64864	NR	825	6067	NR	955	5408	NR
440	65090	NR	570	189735	NR	700	57132	NR	830	6507	NR	960	5406	NR
445	111800	NR	575	192391	NR	705	50899	NR	835	6304	NR	965	5676	NR
450	185327	NR	580	195587	NR	710	44715	NR	840	5605	NR	970	6132	NR
455	231910	NR	585	198690	NR	715	39661	NR	845	5975	NR	975	7732	NR
460	199850	NR	590	200528	NR	720	35220	NR	850	5252	NR	980	4497	NR
465	159032	NR	595	204245	NR	725	31033	NR	855	6570	NR	985	1796	NR
470	134681	NR	600	206961	NR	730	27573	NR	860	6167	NR	990	6719	NR
475	109873	NR	605	207509	NR	735	24077	NR	865	5558	NR	995	10730	NR
480	92595	NR	610	206751	NR	740	21375	NR	870	5280	NR	1000	10317	NR
485	90323	NR	615	205233	NR	745	19152	NR	875	5889	NR			

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Summary

$R_f = 88.6$
 $R_g = 96.2$
 CIE $R_a = 91.5$
 $R_9 = 57.0$



Color Vector Graphics



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

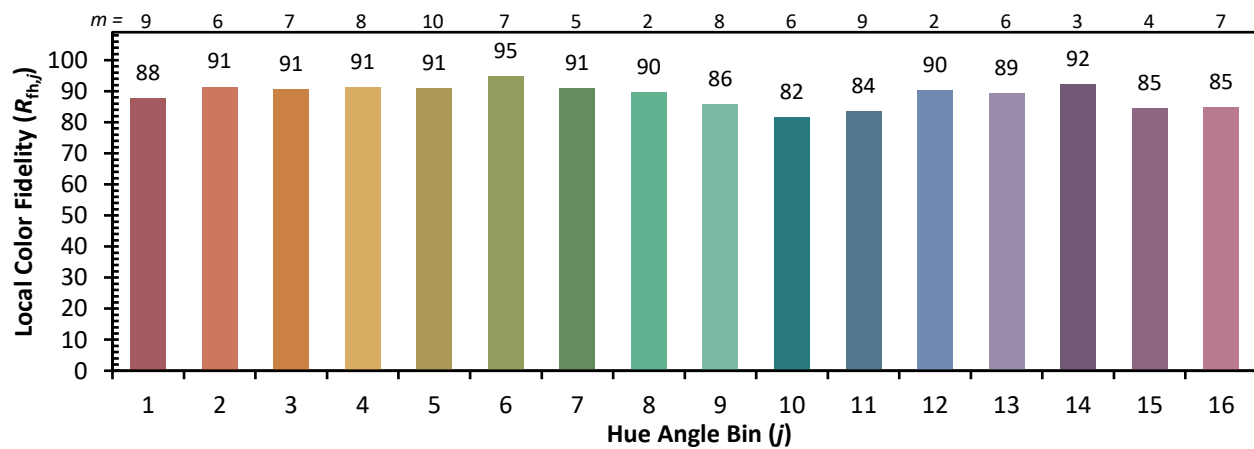
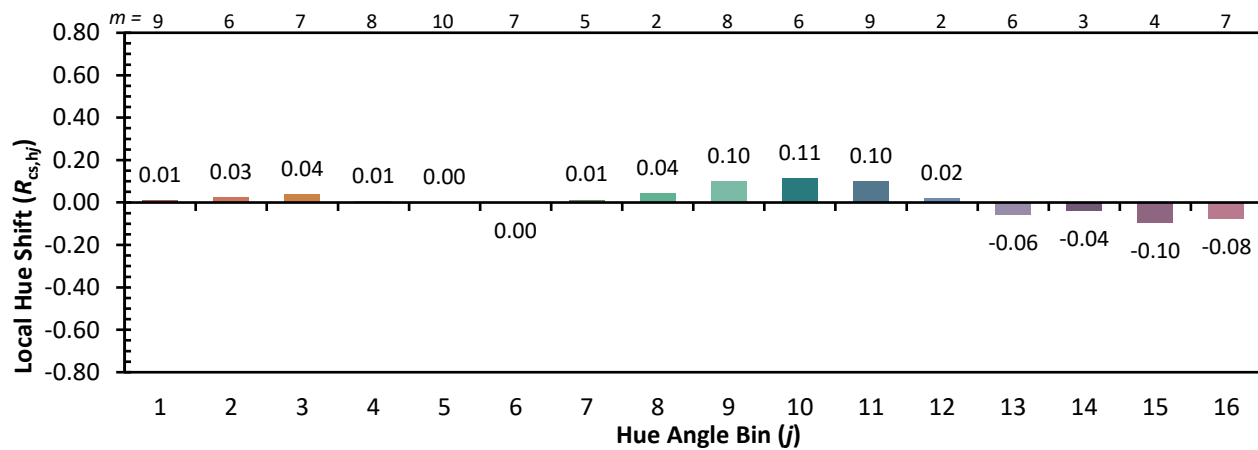
CES01 = 86	CES26 = 95	CES51 = 92	CES76 = 88
CES02 = 62	CES27 = 87	CES52 = 95	CES77 = 88
CES03 = 31	CES28 = 96	CES53 = 92	CES78 = 85
CES04 = 69	CES29 = 92	CES54 = 88	CES79 = 95
CES05 = 49	CES30 = 80	CES55 = 85	CES80 = 93
CES06 = 50	CES31 = 93	CES56 = 87	CES81 = 85
CES07 = 42	CES32 = 94	CES57 = 84	CES82 = 97
CES08 = 41	CES33 = 90	CES58 = 84	CES83 = 96
CES09 = 29	CES34 = 96	CES59 = 94	CES84 = 93
CES10 = 74	CES35 = 97	CES60 = 88	CES85 = 81
CES11 = 57	CES36 = 74	CES61 = 88	CES86 = 85
CES12 = 63	CES37 = 96	CES62 = 76	CES87 = 90
CES13 = 43	CES38 = 75	CES63 = 86	CES88 = 94
CES14 = 74	CES39 = 97	CES64 = 81	CES89 = 86
CES15 = 71	CES40 = 97	CES65 = 83	CES90 = 91
CES16 = 47	CES41 = 91	CES66 = 78	CES91 = 67
CES17 = 49	CES42 = 98	CES67 = 78	CES92 = 76
CES18 = 56	CES43 = 96	CES68 = 83	CES93 = 85
CES19 = 71	CES44 = 99	CES69 = 84	CES94 = 79
CES20 = 66	CES45 = 97	CES70 = 83	CES95 = 81
CES21 = 85	CES46 = 94	CES71 = 74	CES96 = 91
CES22 = 78	CES47 = 90	CES72 = 92	CES97 = 94
CES23 = 91	CES48 = 82	CES73 = 79	CES98 = 92
CES24 = 90	CES49 = 94	CES74 = 89	CES99 = 89
CES25 = 71	CES50 = 93	CES75 = 78	



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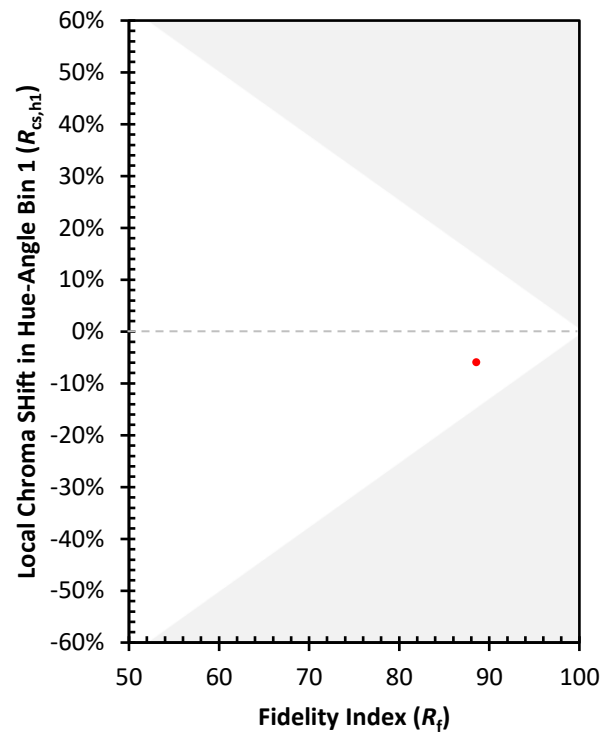
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)