

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ENCL2SF-L08I, ENCL2SFD-930W-W

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CRT-017

ISSUE DATE

8/25/2021

REVISED DATE

None

TEST DATES

8/23/21 through 8/24/21

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104659241CRT-017

MODEL NUMBER(s)

ENCL2SF-L08I, ENCL2SFD-930W-W

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01166088-0.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



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Lighting Division

Reviewer:



Jeff Davis
Technical Lead
Lighting Division

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SAMPLE INFORMATION

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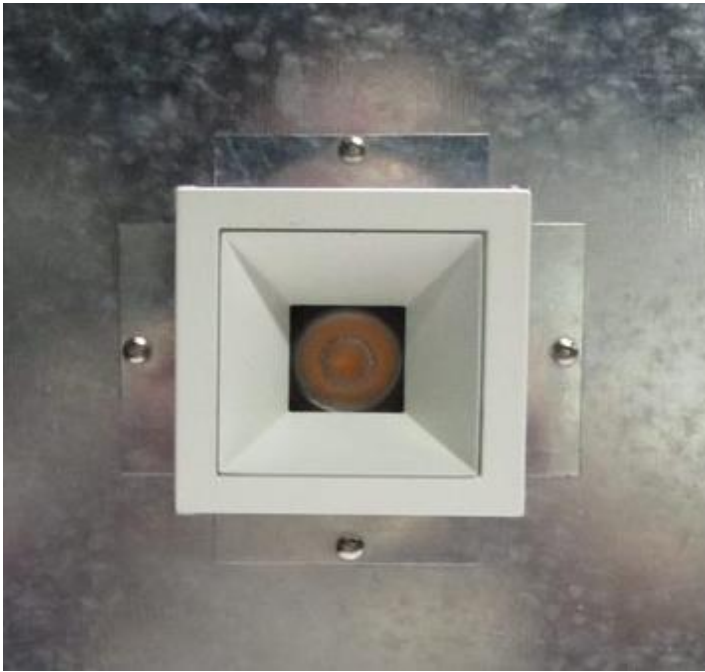
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2108131437-001-1	--	Housing	Production	8/13/2021
2	CRT2108131437-001-2	ESS010W-0200-42	Driver	Production	8/13/2021
3	CRT2108131437-001-5	BXRE-30-G1000-C-83	LED	Production	8/13/2021
4	CRT2108131437-001-10	--	Reflector	Production	8/13/2021
5	CRT2108131437-001-12	--	Trim	Production	8/13/2021
6	CRT2108131437-001-17	--	40° Optic	Production	8/13/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCL2SF-L08I, ENCL2SFD-930W-W	1,2,3,4,5,6

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCL2SF-L08I, ENCL2SFD-930W-W
Product Description:	8 Watt, 40° Beam, 3000K, 0° Tilt
LED Model No.:	BXRE-30-G1000-C-83
Driver Model No.:	ESS010W-0200-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	646.2	647.7
Input Power (W) @ 120 (Vac)	7.40	7.43
Lumen Efficacy (lm/W)	87.3	87.2
Input Power Factor (I) @ 120 (Vac)	0.984	0.982

Criteria	Results
Input ATHD (%) @ 120 (Vac)	12.45
Correlated Color Temperature (K)	3024
Color Rendering Index - Ra (I)	92.4
Color Rendering Index - R9 (I)	75.7
Duv (I)	0.0003
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.403
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.521

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFD-930W-W	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

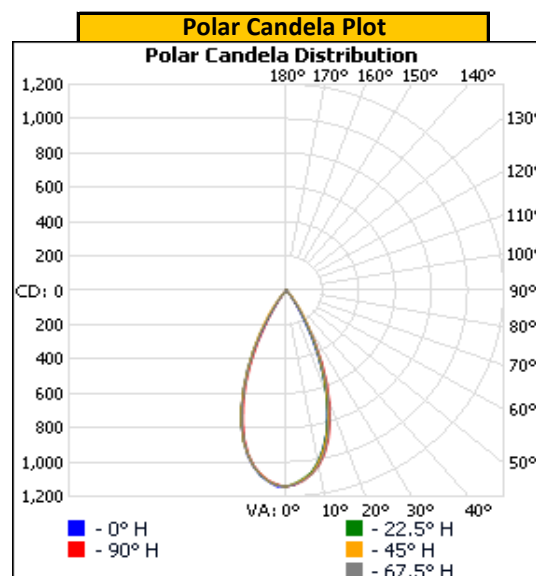
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.07	62.6	7.40	0.984

Light Output (lm)	Lumen Efficacy (lm/W)
646.2	87.3

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	1142	1142	1142	1142	1142
5	1103	1098	1103	1109	1111
10	1013	1012	1018	1032	1035
15	858	859	870	888	898
20	653	648	661	683	696
25	411	421	436	448	466
30	193	217	250	237	228
35	71	93	125	99	85
40	23	31	47	32	26
45	8	10	18	10	9
50	2	3	5	3	2
55	1	1	1	1	1
60	0	0	0	0	0
65	0	0	0	0	0
70	0	0	0	0	0
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0
95	0	0	0	0	0
100	0	0	0	0	0
105	0	0	0	0	0
110	0	0	0	0	0
115	0	0	0	0	0
120	0	0	0	0	0
125	0	0	0	0	0
130	0	0	0	0	0
135	0	0	0	0	0
140	0	0	0	0	0
145	0	0	0	0	0
150	0	0	0	0	0
155	0	0	0	0	0
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



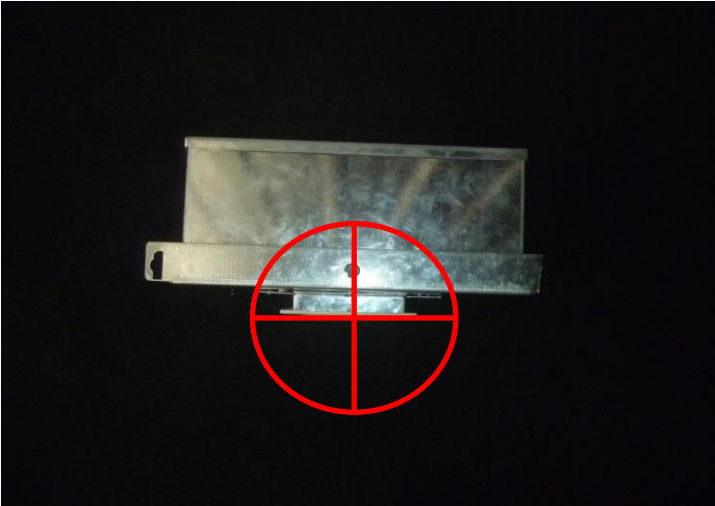
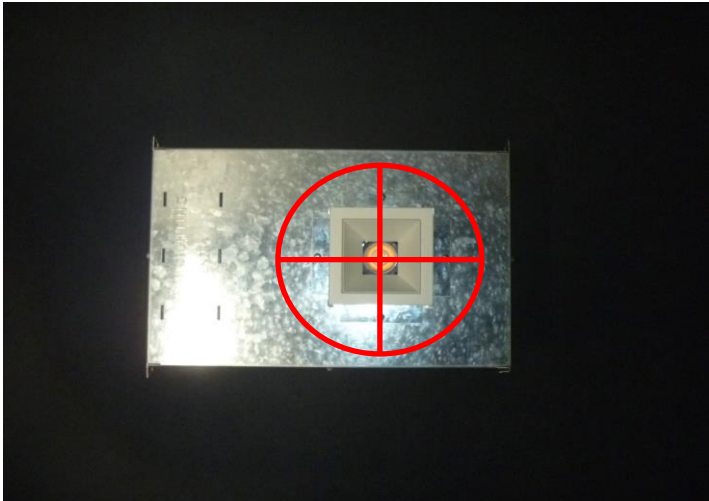
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.21	0.21	0.00
0°-180° H	90°-270° H	0°-180° V

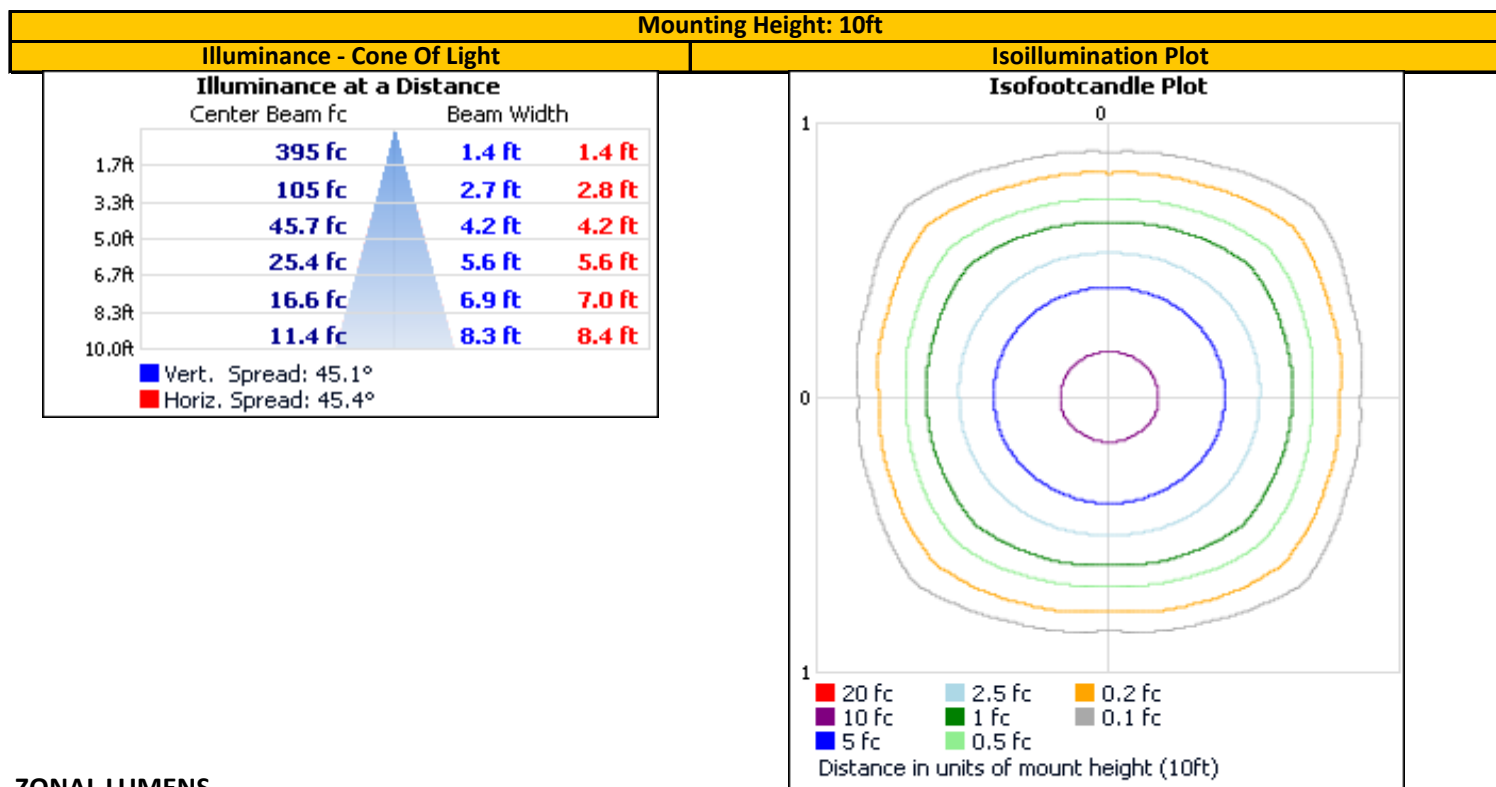
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	557.3	86.2%	0-10	103.4	16.0%
0-40	632.6	97.9%	10-20	243.8	37.7%
0-60	646.2	100.0%	20-30	210.1	32.5%
60-90	0.0	0.0%	30-40	75.3	11.6%
70-100	0.0	0.0%	40-50	12.3	1.9%
90-120	0.0	0.0%	50-60	1.4	0.2%
0-90	646.2	100.0%	60-70	0.0	0.0%
90-180	0.0	0.0%	70-80	0.0	0.0%
0-180	646.2	100.0%	80-90	0.0	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%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFD-930W-W	NA

PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

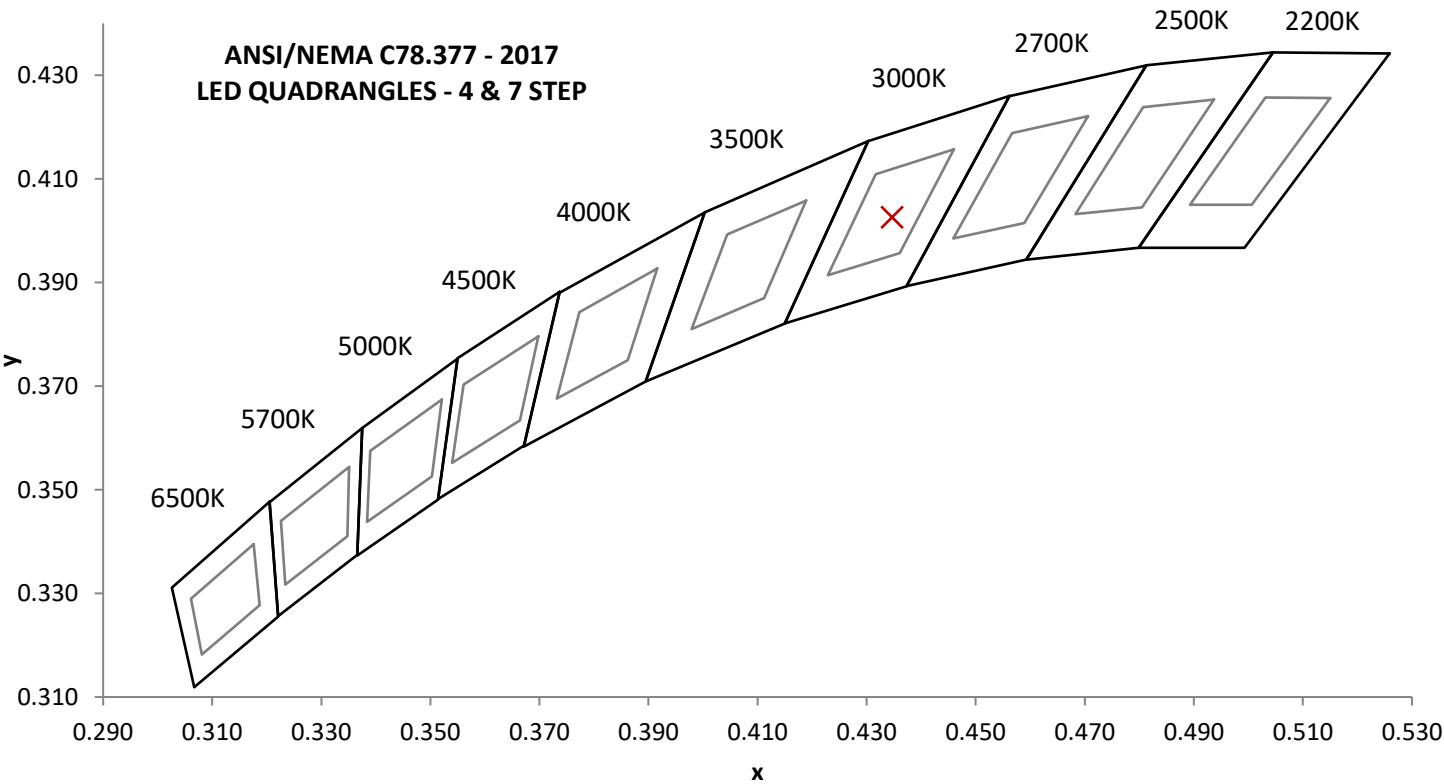
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.04	63.1	7.43	0.982	12.45

Measured at 120.04(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
647.7	87.2	3024	92.4	75.7

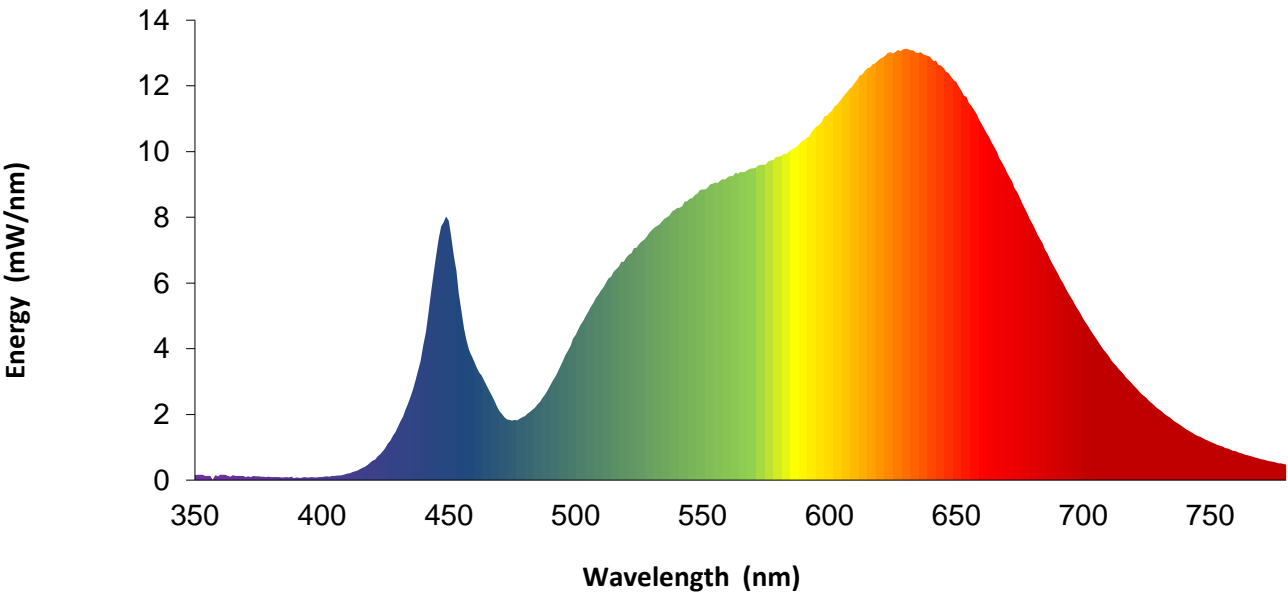
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0003	0.435	0.403	0.250	0.521



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	3.6		570	9.5		680	7.8
355	0.1		465	2.9		575	9.6		685	7.0
360	0.2		470	2.1		580	9.8		690	6.3
365	0.1		475	1.8		585	10.1		695	5.6
370	0.1		480	1.9		590	10.4		700	4.9
375	0.1		485	2.3		595	10.8		705	4.3
380	0.1		490	2.9		600	11.2		710	3.8
385	0.1		495	3.6		605	11.6		715	3.3
390	0.1		500	4.4		610	12.1		720	2.9
395	0.1		505	5.1		615	12.5		725	2.5
400	0.1		510	5.8		620	12.8		730	2.1
405	0.1		515	6.3		625	13.0		735	1.9
410	0.2		520	6.8		630	13.1		740	1.6
415	0.3		525	7.2		635	13.0		745	1.3
420	0.6		530	7.6		640	12.9		750	1.2
425	1.0		535	8.0		645	12.5		755	1.0
430	1.6		540	8.3		650	12.1		760	0.9
435	2.6		545	8.6		655	11.5		765	0.8
440	4.1		550	8.8		660	10.8		770	0.6
445	6.8		555	9.1		665	10.1		775	0.6
450	7.9		560	9.2		670	9.4		780	0.5
455	5.2		565	9.4		675	8.6		---	---



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Elgar AC Power Supply	CW1251	---	VBU	VBU
2	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
3	Traceable Hygrothermometer	4800	L206	2/12/2021	2/12/2022
4	Yokogawa Power Analyzer	WT1600	E474	6/15/2021	6/15/2022
5	Fluke Thermometer	53 II	D587	2/5/2021	2/5/2022
6	3M Integrating Sphere Spectrometer System	CDS 1100	O235	7/26/2021	10/26/2021
7	Fisher Scientific Stopwatch	14-649-9	N1132	3/26/2021	3/26/2022
8	LSI High Speed Mirror Goniophotometer	6440	---	8/16/2021	11/16/2021
9	Elgar AC Power Supply	CW1251	---	VBU	VBU
10	Yokogawa Power Analyzer	WT210	E464	5/11/2021	5/11/2022
11	Traceable Hygrothermometer	4800	L204	2/21/2021	2/21/2022
12	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
13	Omega Thermometer	DPi8-C24	M263	3/23/2021	3/23/2022
14	Bosch Distance Laser	Pro GLM 20	L211	3/3/2021	3/3/2022
15	M-D Building Products Digital Level	Smart Tool	L112	5/26/2021	5/26/2022

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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ANNEX A - TM-30 CALCULATIONS

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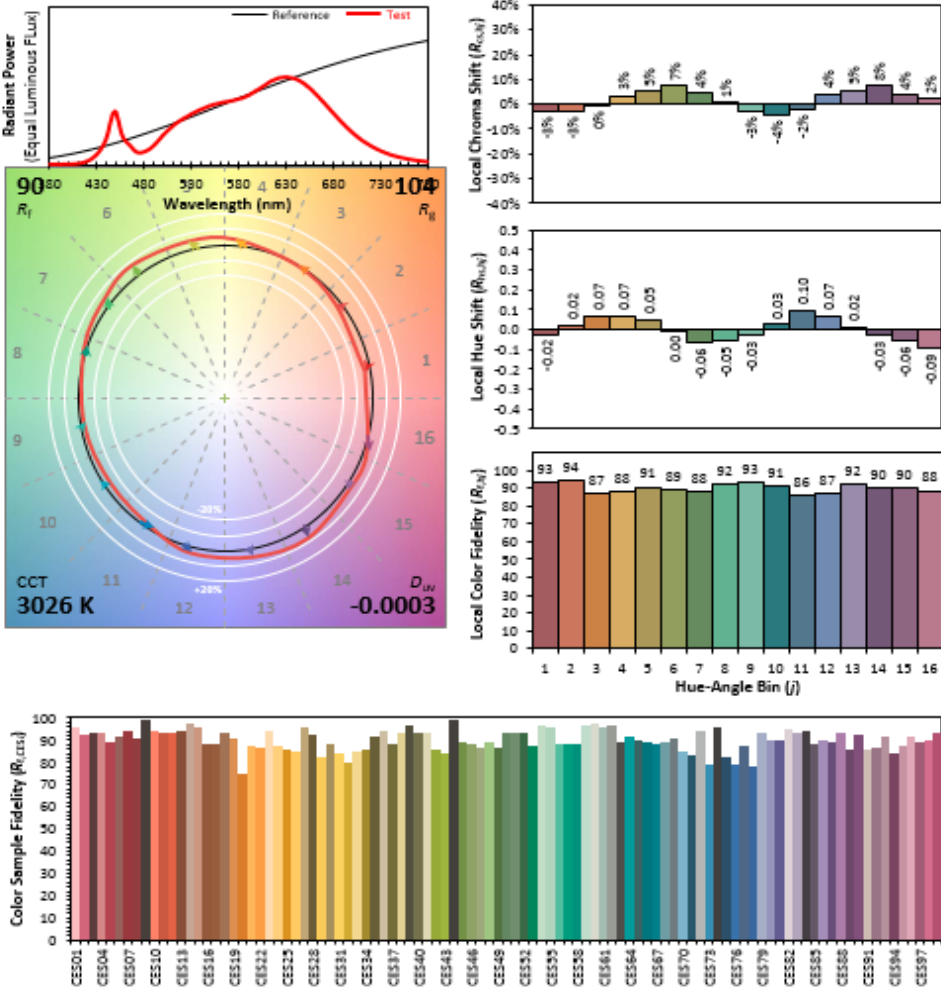
Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFD-930W-W	NA

TM-30 REPORT

ANSI/IES TM-30-18 Color Rendition Report

Source: 104659241CRT-017
Date: 8/25/2021

Manufacturer: VISUAL COMFORT AND COMPANY
Model: ENCL2SF-L08I, ENCL2SFD-930W-W



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4347
y 0.4026
u' 0.2497
v' 0.5205

Colors are for visual orientation purposes only. Created with the IES TM-30-18 Calculator Version 2.00.