

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCL2SF-L12I, ENCL2SFD-930W-W

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-013

## ISSUE DATE

8/26/2021

## REVISED DATE

None

## TEST DATES

8/19/21 through 8/25/21

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

104659241CRT-013

**MODEL NUMBER(s)**

ENCL2SF-L12I, 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:



Gerald Gray  
Associate Engineer  
Lighting Division

Reviewer:



Jeff Davis  
Technical Lead  
Lighting Division

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**SAMPLE INFORMATION**

**REPORT NO. 104659241CRT-013**

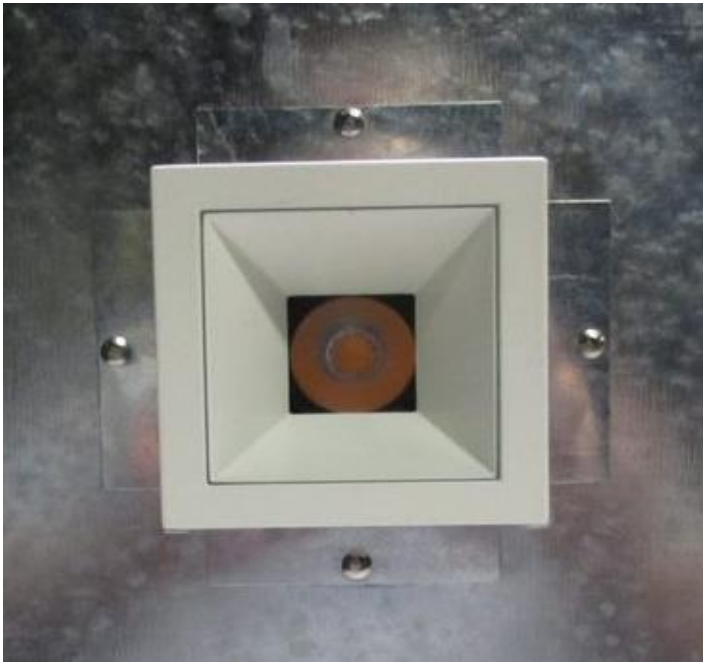
**ITEMS RECEIVED**

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2108131437-001-1	--	Housing	Production	8/13/2021
2	CRT2108131437-001-3	PTB15W-0300-38-VCC	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	CRT2108131437-001-13	--	20° Optic	Production	8/13/2021

**TESTED SAMPLE CONFIGURATIONS**

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCL2SF-L12I, ENCL2SFD-930W-W	1,2,3,4,5,6

**SAMPLE PHOTOS - TESTED CONFIGURATIONS**



## SUMMARY

REPORT NO. 104659241CRT-013

### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCL2SF-L12I, ENCL2SFD-930W-W
Product Description:	12 Watt, 20° Beam, 3000K, 0° Tilt
LED Model No.:	BXRE-30-G1000-C-83
Driver Model No.:	PTB15W-0300-38-VCC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	848.6	845.0
Input Power (W) @ 120 (Vac)	10.86	10.86
Lumen Efficacy (lm/W)	78.1	77.8
Input Power Factor (I) @ 120 (Vac)	0.983	0.981

Criteria	Results
Input ATHD (%) @ 120 (Vac)	15.50
Correlated Color Temperature (K)	3043
Color Rendering Index - Ra (I)	92.5
Color Rendering Index - R9 (I)	75.3
Duv (I)	0.0010
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.400
Chromaticity Coordinate (u')	0.249
Chromaticity Coordinate (v')	0.519

## 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**

**REPORT NO. 104659241CRT-013**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-930W-W	NA

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

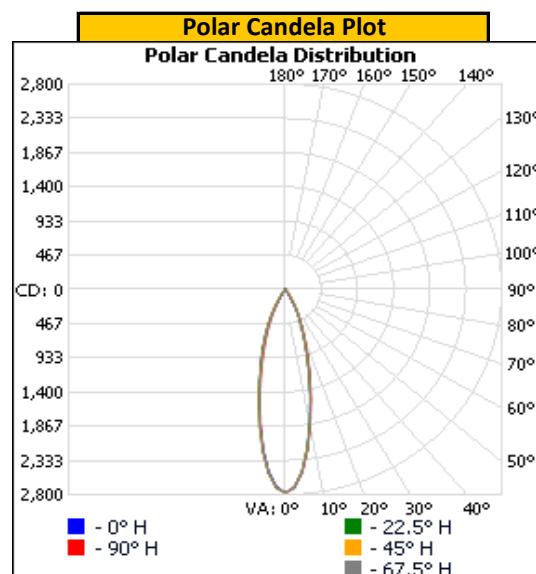
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.01	92.1	10.86	0.983

Light Output (lm)	Lumen Efficacy (lm/W)
848.6	78.1

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	2773	2773	2773	2773	2773
5	2487	2485	2491	2497	2504
10	1830	1823	1841	1847	1857
15	1185	1172	1179	1196	1233
20	709	705	719	726	763
25	414	415	429	427	436
30	152	211	250	212	174
35	43	63	146	70	56
40	20	28	46	29	22
45	5	6	22	7	6
50	3	3	7	4	4
55	2	2	2	2	2
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



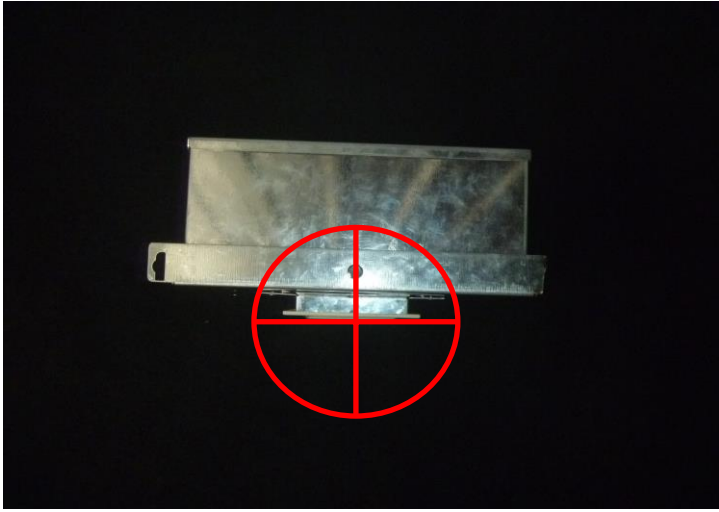
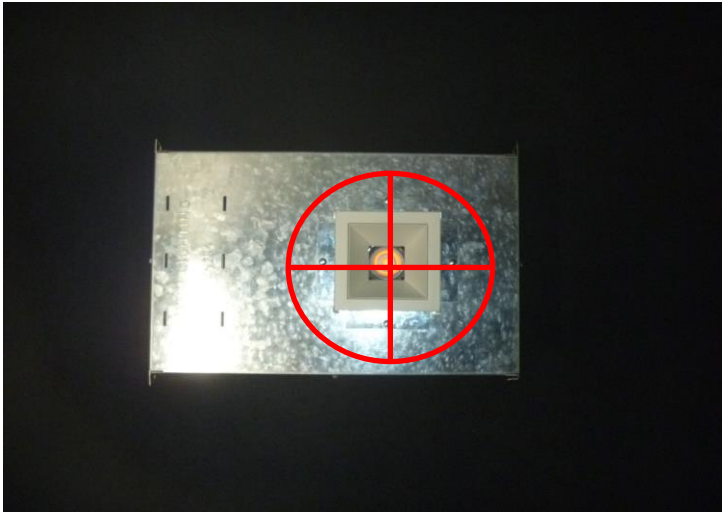
REPORT NO. 104659241CRT-013

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

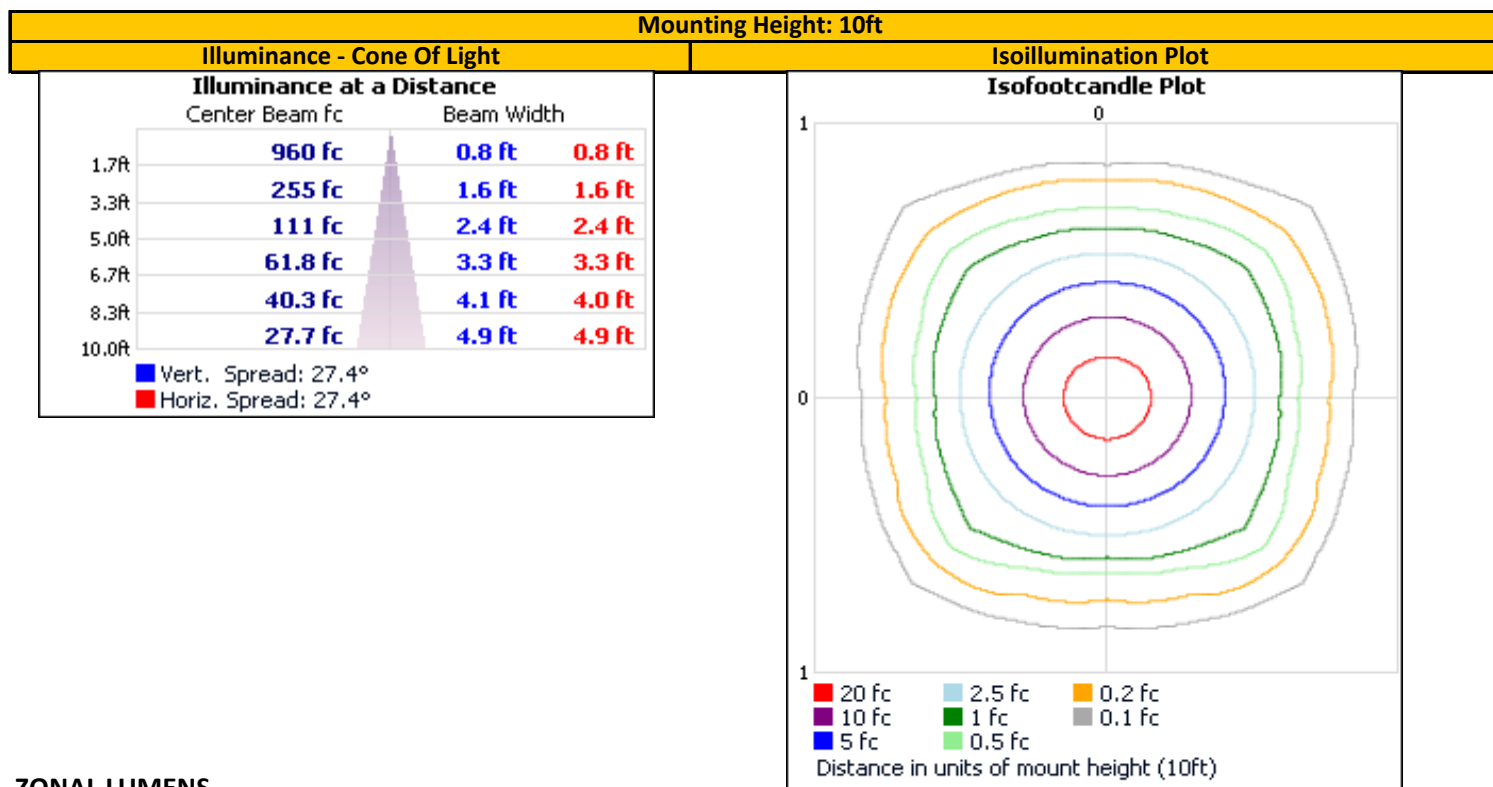
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



REPORT NO. 104659241CRT-013

## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	771.4	90.9%	0-10	216.7	25.5%
0-40	836.0	98.5%	10-20	341.4	40.2%
0-60	848.6	100.0%	20-30	213.4	25.1%
60-90	0.0	0.0%	30-40	64.5	7.6%
70-100	0.0	0.0%	40-50	10.8	1.3%
90-120	0.0	0.0%	50-60	1.8	0.2%
0-90	848.6	100.0%	60-70	0.0	0.0%
90-180	0.0	0.0%	70-80	0.0	0.0%
0-180	848.6	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**

**REPORT NO. 104659241CRT-013**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-930W-W	NA

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

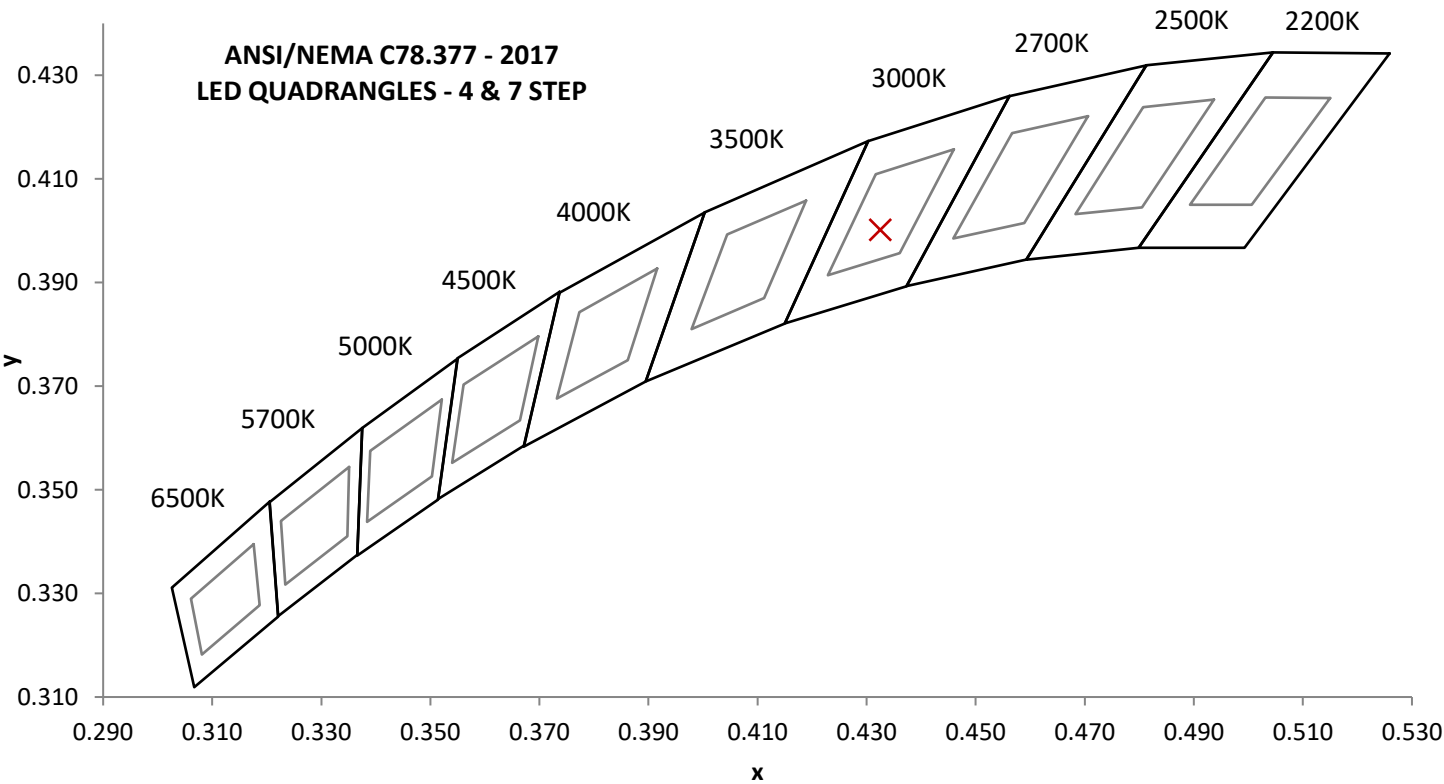
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.00	92.3	10.86	0.981	15.50

**Measured at 120(Vac)**

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
845.0	77.8	3043	92.5	75.3

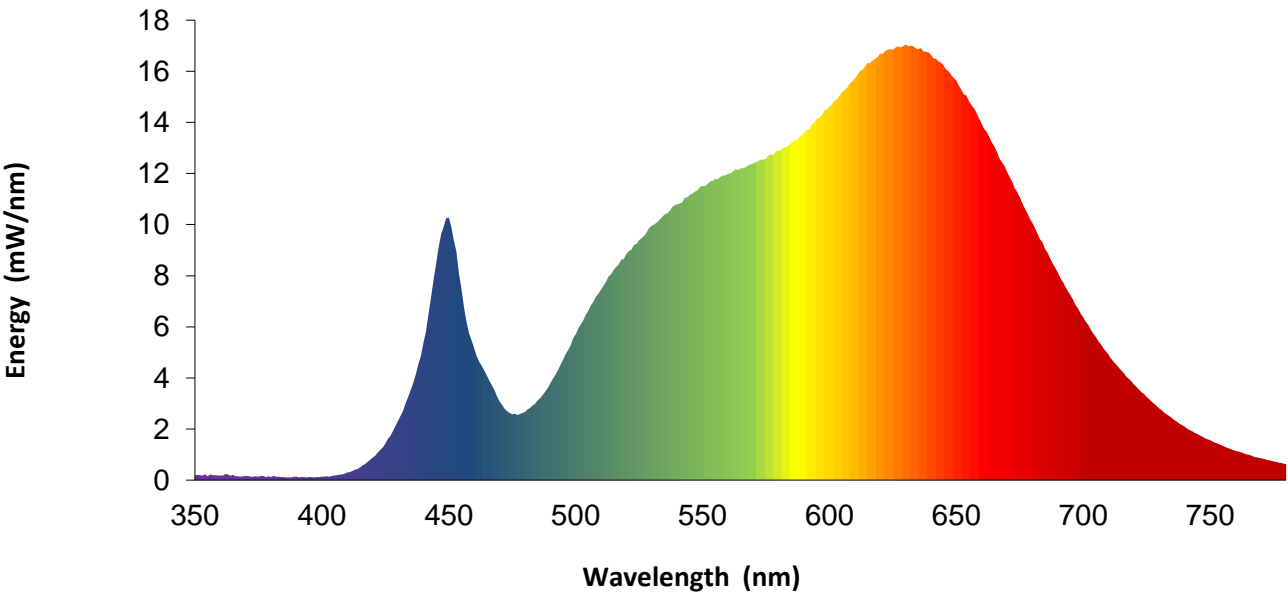
Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0010	0.433	0.400	0.249	0.519



REPORT NO. 104659241CRT-013

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	5.2		570	12.4		680	10.1
355	0.2		465	4.1		575	12.6		685	9.0
360	0.2		470	3.1		580	12.9		690	8.1
365	0.2		475	2.6		585	13.2		695	7.2
370	0.2		480	2.7		590	13.6		700	6.4
375	0.1		485	3.1		595	14.1		705	5.6
380	0.1		490	3.8		600	14.6		710	4.9
385	0.1		495	4.7		605	15.2		715	4.3
390	0.1		500	5.7		610	15.7		720	3.7
395	0.1		505	6.6		615	16.3		725	3.3
400	0.1		510	7.4		620	16.7		730	2.8
405	0.2		515	8.2		625	16.8		735	2.4
410	0.3		520	8.8		630	17.0		740	2.1
415	0.5		525	9.4		635	16.9		745	1.8
420	0.9		530	10.0		640	16.7		750	1.6
425	1.4		535	10.4		645	16.2		755	1.3
430	2.3		540	10.8		650	15.6		760	1.2
435	3.5		545	11.2		655	14.8		765	1.0
440	5.3		550	11.5		660	13.9		770	0.9
445	8.4		555	11.8		665	13.1		775	0.7
450	10.3		560	12.0		670	12.1		780	0.6
455	7.5		565	12.2		675	11.1		---	---



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

**EQUIPMENT LIST**

**REPORT NO. 104659241CRT-013**

#	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	---	---	---
---	---	---	---	---
---	---	---	---	---

**ANNEX A - TM-30 CALCULATIONS**

**REPORT NO. 104659241CRT-013**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-930W-W	NA

**TM-30 REPORT**

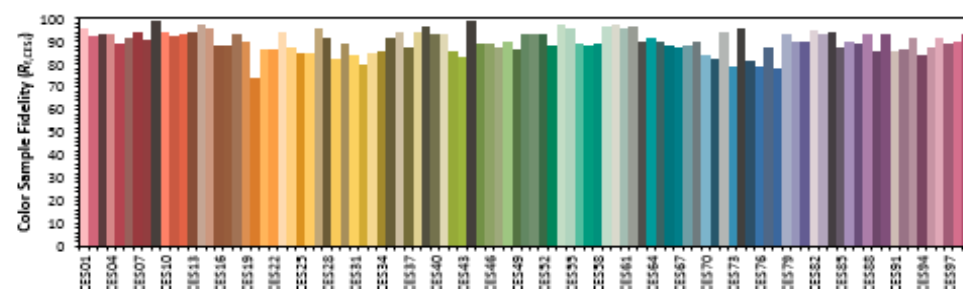
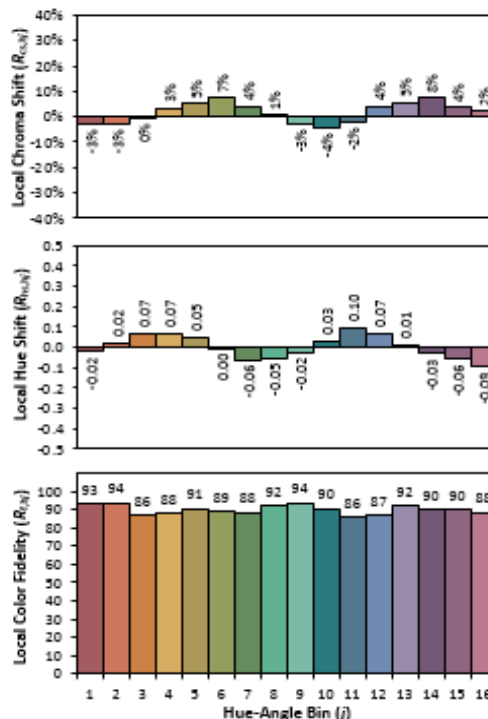
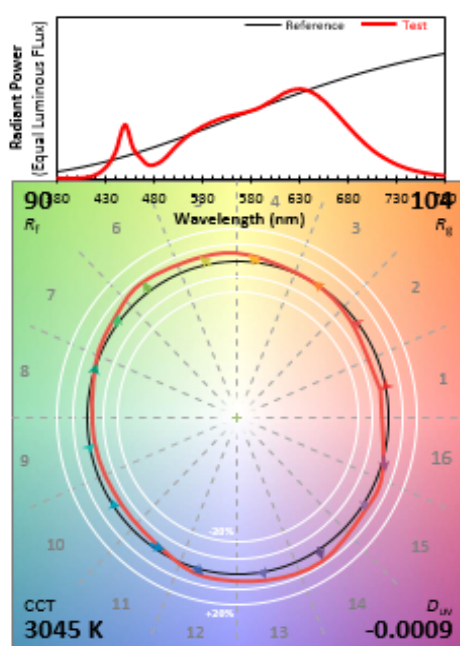
**ANSI/IES TM-30-18 Color Rendition Report**

Source: 104659241CRT-013

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 8/25/2021

Model: ENCL2SF-L12I, ENCL2SFD-930W-W



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

x 0.4325  
y 0.4002  
u' 0.2494  
v' 0.5192

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