

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCL2SF-L12I, ENCL2SFD-927W-W

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-019

## ISSUE DATE

8/25/2021

## REVISED DATE

None

## TEST DATES

8/23/2021

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

104659241CRT-019

**MODEL NUMBER(s)**

ENCL2SF-L12I, ENCL2SFD-927W-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  
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Lighting Division

Reviewer:



Jeff Davis  
Technical Lead  
Lighting Division

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**SAMPLE INFORMATION**

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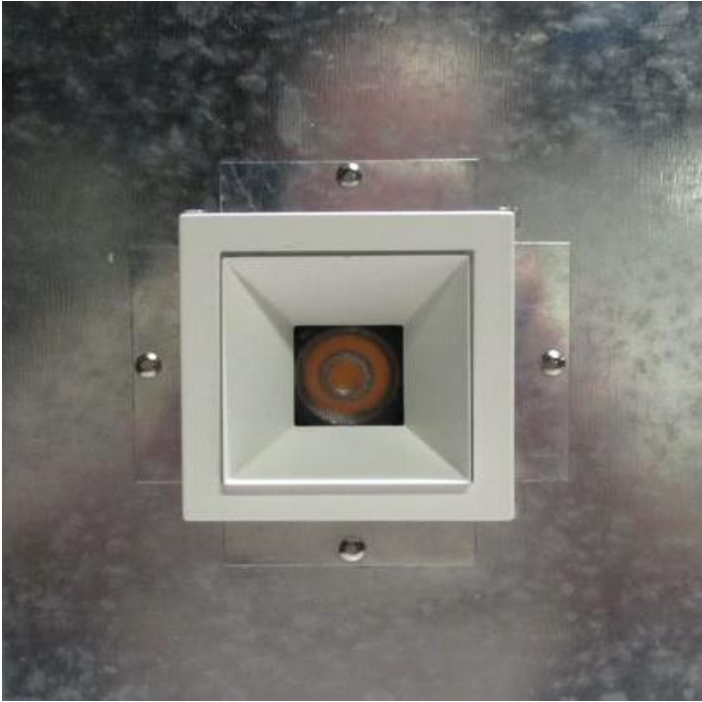
**ITEMS RECEIVED**

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2108131437-001-1	--	Housing	Production	8/13/2021
2	CRT2108131437-001-3	PTB15W-0300-38-VCC	Driver	Production	8/13/2021
3	CRT2108131437-001-4	BXRE-27-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-L12I, ENCL2SFD-927W-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-L12I, ENCL2SFD-927W-W
Product Description:	12 Watt, 40° Beam, 2700K, 0° Tilt
LED Model No.:	BXRE-27-G1000-C-83
Driver Model No.:	PTB15W-0300-38-VCC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	759.5	774.8
Input Power (W) @ 120 (Vac)	10.79	10.80
Lumen Efficacy (lm/W)	70.4	71.7
Input Power Factor (I) @ 120 (Vac)	0.983	0.980

Criteria	Results
Input ATHD (%) @ 120 (Vac)	15.56
Correlated Color Temperature (K)	2708
Color Rendering Index - Ra (I)	91.9
Color Rendering Index - R9 (I)	67.0
Duv (I)	0.0017
Chromaticity Coordinate (x)	0.457
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.263
Chromaticity Coordinate (v')	0.525

## 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-L12I, ENCL2SFD-927W-W	NA

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

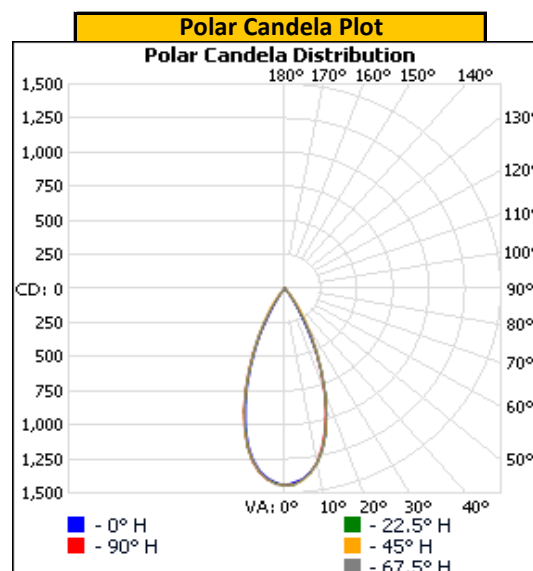
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.00	91.5	10.79	0.983

Light Output (lm)	Lumen Efficacy (lm/W)
759.5	70.4

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	1444	1444	1444	1444	1444
5	1402	1411	1412	1406	1405
10	1297	1300	1295	1294	1290
15	1098	1098	1096	1088	1076
20	817	820	819	814	802
25	519	532	536	530	516
30	230	268	313	286	248
35	84	111	167	114	95
40	28	38	59	41	34
45	11	12	24	13	12
50	3	4	6	5	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



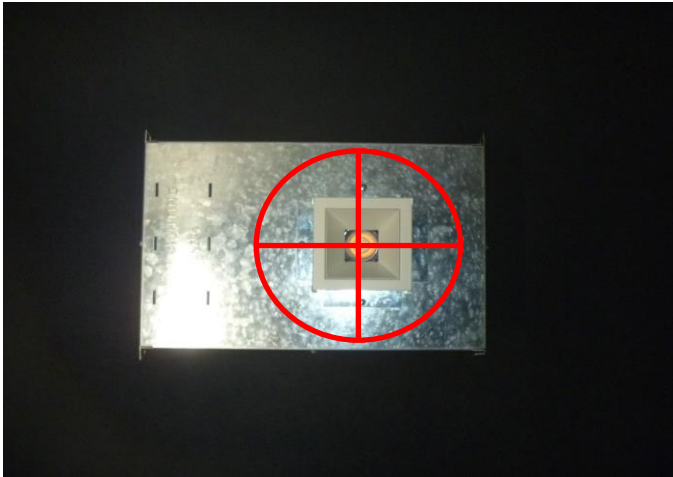
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ORIENTATION AND ALIGNMENT OF EUT

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

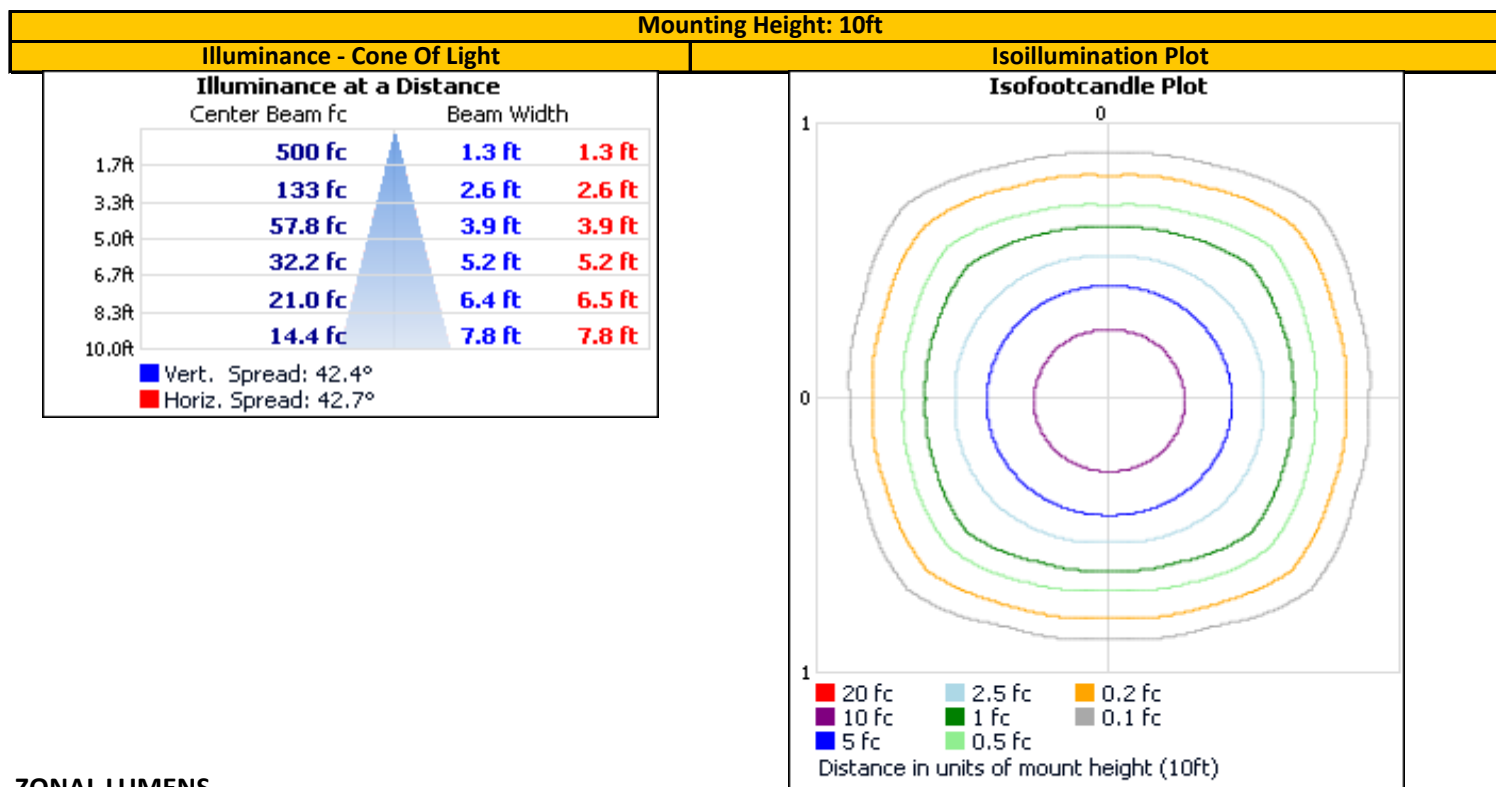
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	660.7	87.0%	0-10	130.3	17.2%
0-40	742.6	97.8%	10-20	294.6	38.8%
0-60	759.3	100.0%	20-30	235.8	31.0%
60-90	0.1	0.0%	30-40	81.9	10.8%
70-100	0.0	0.0%	40-50	14.6	1.9%
90-120	0.0	0.0%	50-60	2.1	0.3%
0-90	759.5	100.0%	60-70	0.1	0.0%
90-180	0.0	0.0%	70-80	0.0	0.0%
0-180	759.5	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-L12I, ENCL2SFD-927W-W	NA

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

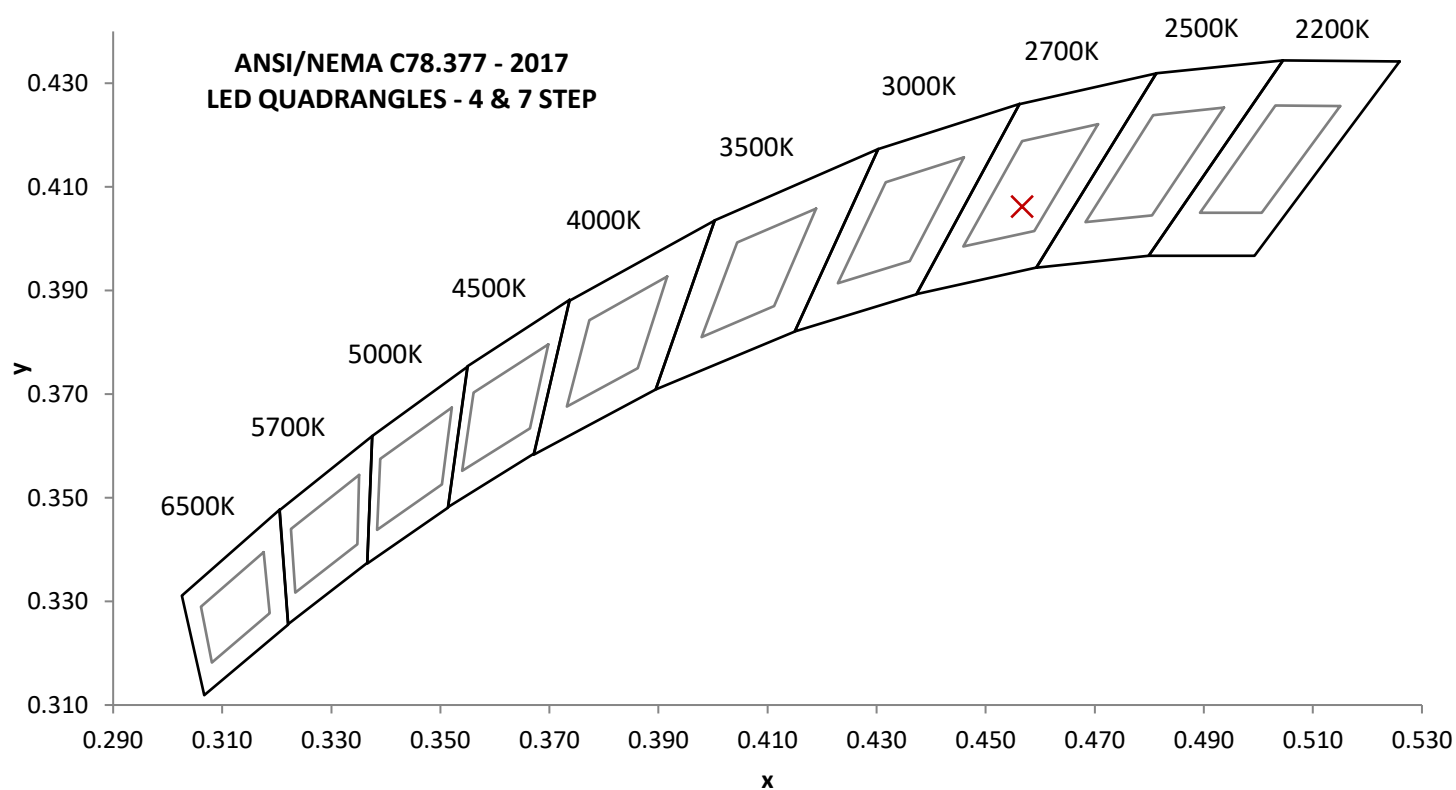
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.02	91.8	10.80	0.980	15.56

Measured at 120.02(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
774.8	71.7	2708	91.9	67.0

Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0017	0.457	0.406	0.263	0.525

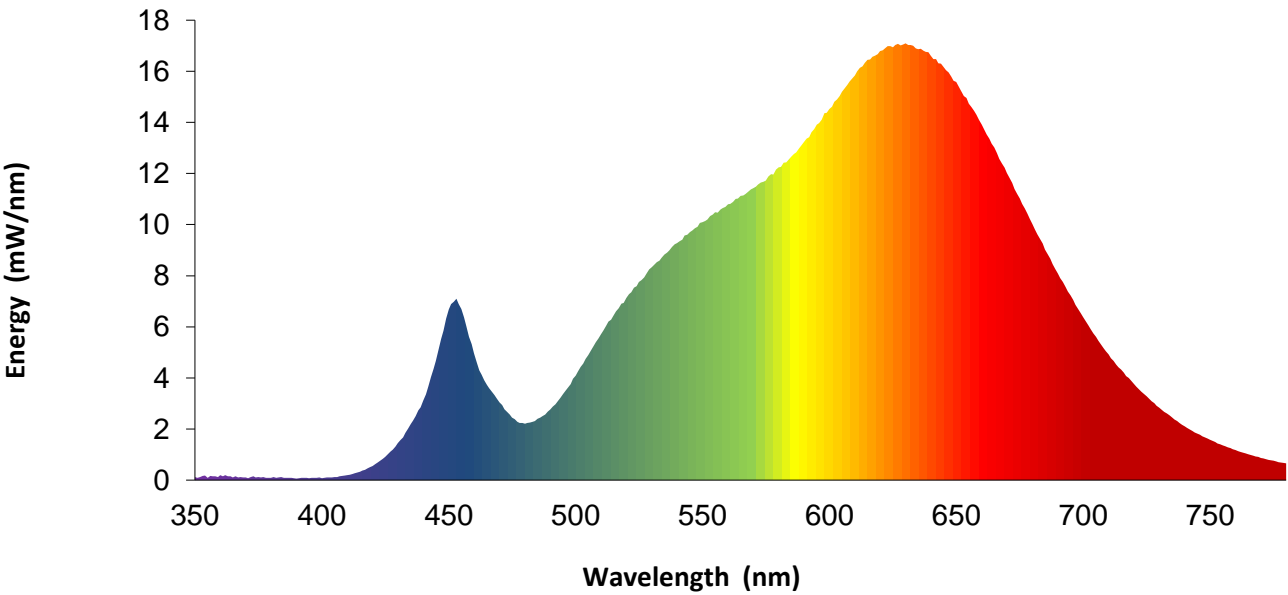




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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	5.0		570	11.4		680	10.0
355	0.1		465	3.7		575	11.7		685	9.0
360	0.2		470	3.0		580	12.2		690	8.1
365	0.1		475	2.4		585	12.7		695	7.2
370	0.1		480	2.2		590	13.2		700	6.4
375	0.1		485	2.4		595	13.9		705	5.6
380	0.1		490	2.8		600	14.5		710	4.9
385	0.1		495	3.4		605	15.2		715	4.3
390	0.1		500	4.1		610	15.8		720	3.8
395	0.1		505	4.9		615	16.4		725	3.3
400	0.1		510	5.7		620	16.8		730	2.8
405	0.1		515	6.5		625	16.9		735	2.5
410	0.2		520	7.1		630	17.1		740	2.1
415	0.3		525	7.8		635	16.9		745	1.8
420	0.6		530	8.3		640	16.6		750	1.6
425	0.9		535	8.8		645	16.2		755	1.4
430	1.4		540	9.3		650	15.6		760	1.2
435	2.2		545	9.7		655	14.7		765	1.0
440	3.1		550	10.1		660	13.9		770	0.9
445	4.7		555	10.5		665	13.0		775	0.8
450	6.7		560	10.8		670	12.0		780	0.7
455	6.7		565	11.1		675	11.0		---	---



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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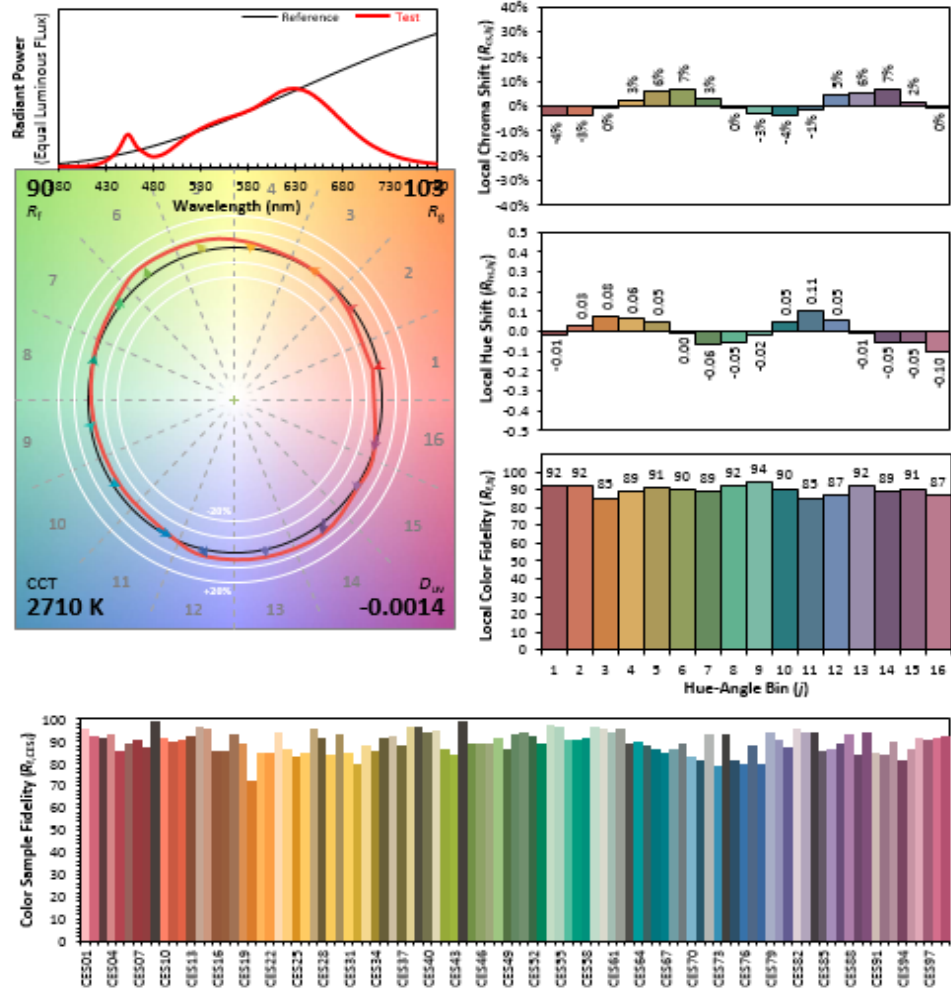
Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-927W-W	NA

TM-30 REPORT

ANSI/IES TM-30-18 Color Rendition Report

Source: 104659241CRT-019  
Date: 8/25/2021

Manufacturer: VISUAL COMFORT AND COMPANY  
Model: ENCL2SF-L12I, ENCL2SFD-927W-W



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

x 0.4567  
y 0.4062  
u' 0.2625  
v' 0.5252

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