VISUAL COMFORT AND COMPANY

TEST REPORT

SCOPE OF WORK
LED Performance Testing

MODEL NUMBER
ENCL2SF-L12I, ENCL2SFD-WD31W-W

PROJECT NUMBER
G104659241

REPORT NUMBER
104659241CRT-011

ISSUE DATE
8/25/2021

REVISED DATE
None

TEST DATES
8/19/21 through 8/25/21

DOCUMENT CONTROL NUMBER
RTTDS-R-AMER-Test-3407

PAGES
11

REPORT NUMBER
104659241CRT-011

MODEL NUMBER(s)
ENCL2SF-L12I, ENCL2SFD-WD31W-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:	Reviewer:
	
Gerald Gray Associate Engineer Lighting Division	Jeff Davis Technical Lead Lighting Division

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SAMPLE INFORMATION

REPORT NO. 104659241CRT-011

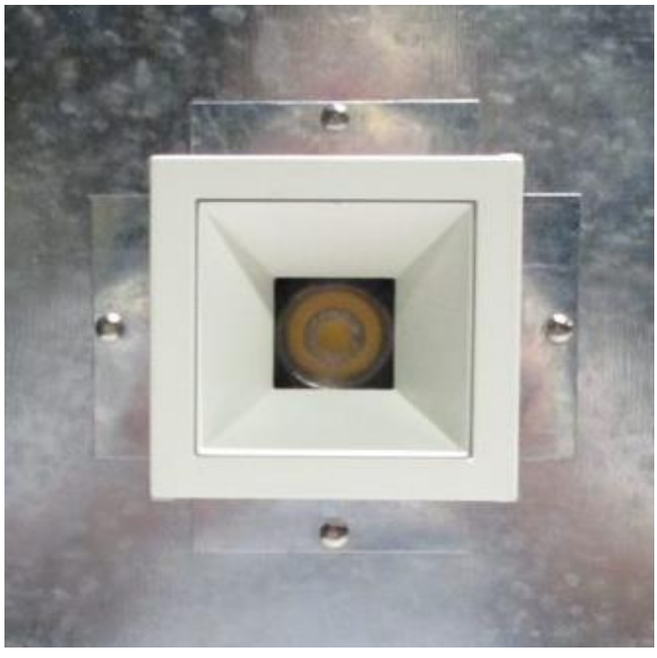
ITEMS RECEIVED

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	CRT2108131437-001-7	BXRV-TR-2750G-10A0-A-23	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-WD31W-W	1,2,3,4,5,6

SAMPLE PHOTOS - TESTED CONFIGURATIONS



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SUMMARY

REPORT NO. 104659241CRT-011

PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCL2SF-L12I, ENCL2SFD-WD31W-W
Product Description:	12 Watt, 40° Beam, Warm Dim, 0° Tilt
LED Model No.:	BXRV-TR-2750G-10A0-A-23
Driver Model No.:	PTB15W-0300-38-VCC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	738.5	738.6
Input Power (W) @ 120 (Vac)	11.68	11.71
Lumen Efficacy (lm/W)	63.2	63.1
Input Power Factor () @ 120 (Vac)	0.985	0.983

Criteria	Results
Input ATHD (%) @ 120 (Vac)	14.28
Correlated Color Temperature (K)	2941
Color Rendering Index - Ra ()	94.3
Color Rendering Index - R9 ()	77.6
Duv ()	0.0057
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.389
Chromaticity Coordinate (u')	0.255
Chromaticity Coordinate (v')	0.515

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.

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TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 104659241CRT-011

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-WD31W-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	120.11	98.7	11.68	0.985

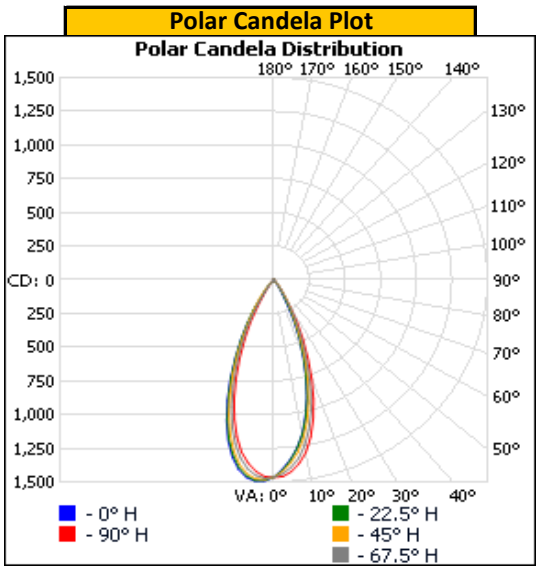
Light Output (lm)	Lumen Efficacy (lm/W)
738.5	63.2

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	1464	1464	1464	1464	1464
5	1337	1342	1363	1396	1427
10	1156	1160	1194	1247	1299
15	898	903	946	1008	1068
20	601	612	652	708	776
25	334	359	385	434	483
30	128	150	210	218	223
35	46	58	101	89	88
40	14	20	37	31	31
45	5	6	15	9	10
50	1	1	3	3	3
55	0	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

Polar Candela Plot



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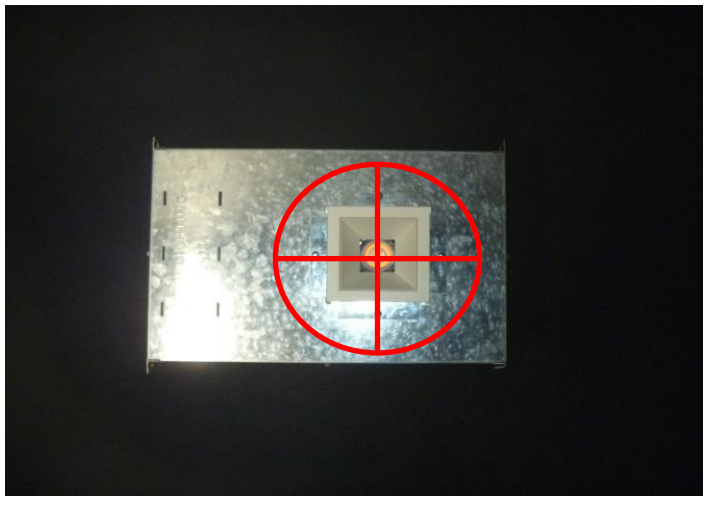
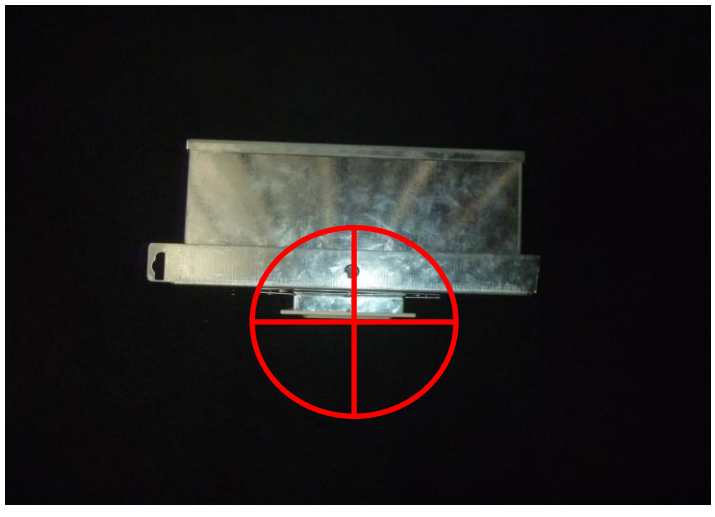
ORIENTATION AND ALIGNMENT OF EUT

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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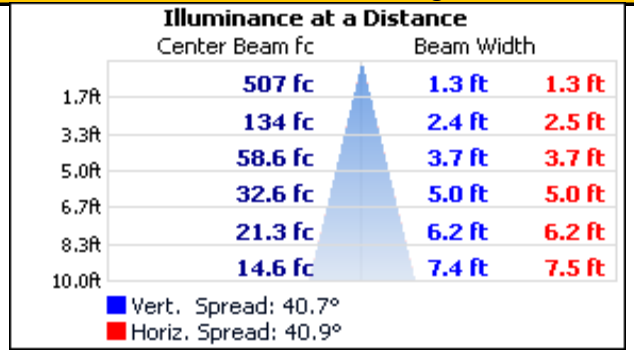
REPORT NO. 104659241CRT-011

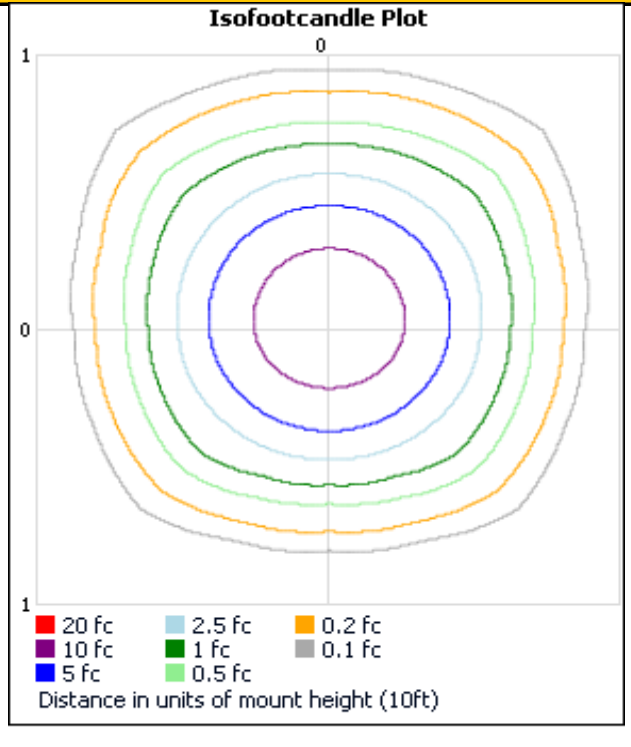
ILLUMINANCE SUMMARY

Mounting Height: 10ft

Illuminance - Cone Of Light



Isoillumination Plot



ZONAL LUMENS

Zonal Lumen Summary

Zone	Lumens	Luminaire
0-30	645.4	87.4%
0-40	723.0	97.9%
0-60	738.5	100.0%
60-90	0.0	0.0%
70-100	0.0	0.0%
90-120	0.0	0.0%
0-90	738.5	100.0%
90-180	0.0	0.0%
0-180	738.5	100.0%

Zone	Lumens	Total	Zone	Lumens	Total
0-10	131.4	17.8%	90-100	0.0	0.0%
10-20	290.1	39.3%	100-110	0.0	0.0%
20-30	223.9	30.3%	110-120	0.0	0.0%
30-40	77.6	10.5%	120-130	0.0	0.0%
40-50	14.0	1.9%	130-140	0.0	0.0%
50-60	1.5	0.2%	140-150	0.0	0.0%
60-70	0.0	0.0%	150-160	0.0	0.0%
70-80	0.0	0.0%	160-170	0.0	0.0%
80-90	0.0	0.0%	170-180	0.0	0.0%

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INTEGRATING SPHERE TESTING **REPORT NO. 104659241CRT-011**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-WD31W-W	NA

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

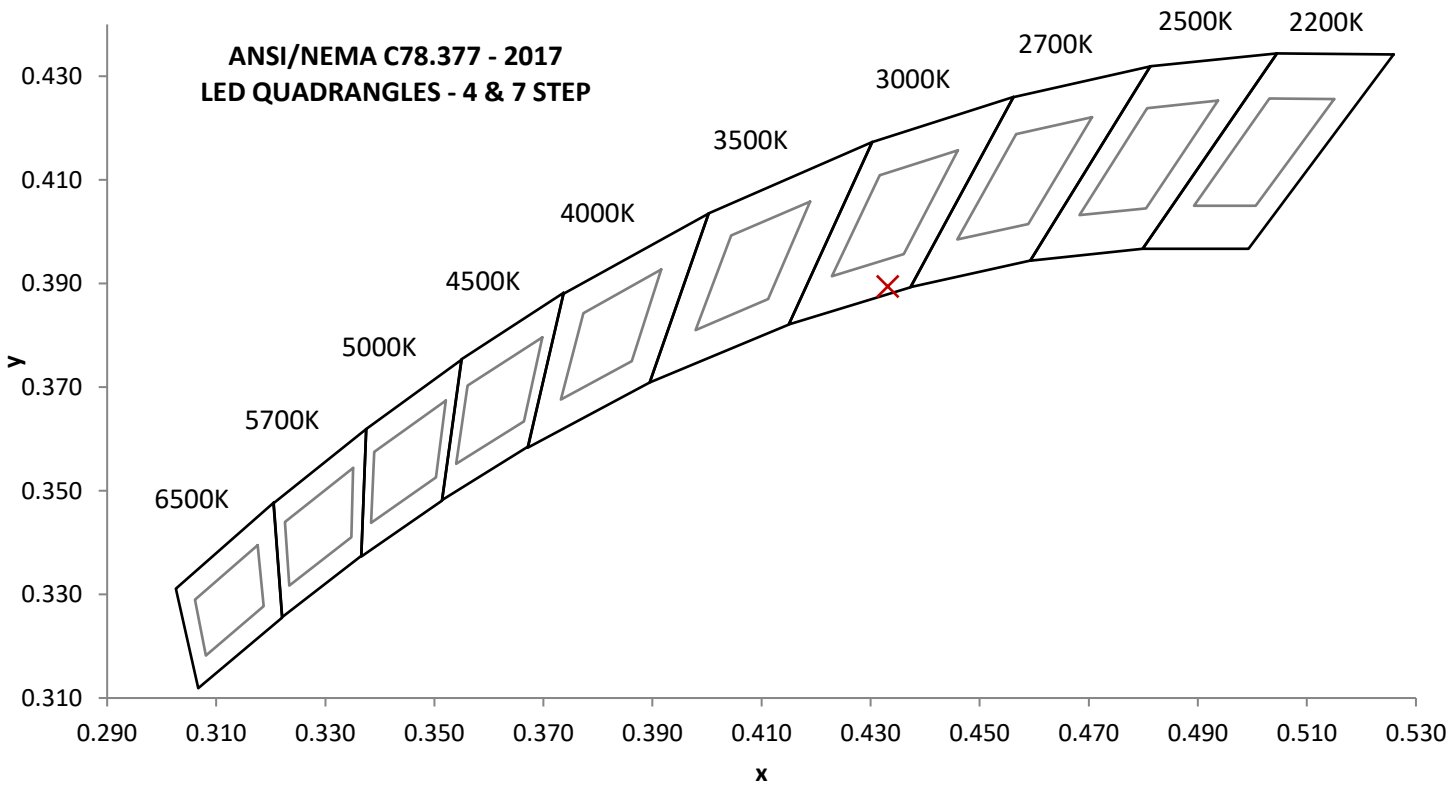
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.01	99.2	11.71	0.983	14.28

Measured at 120.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
738.6	63.1	2941	94.3	77.6

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0057	0.433	0.389	0.255	0.515



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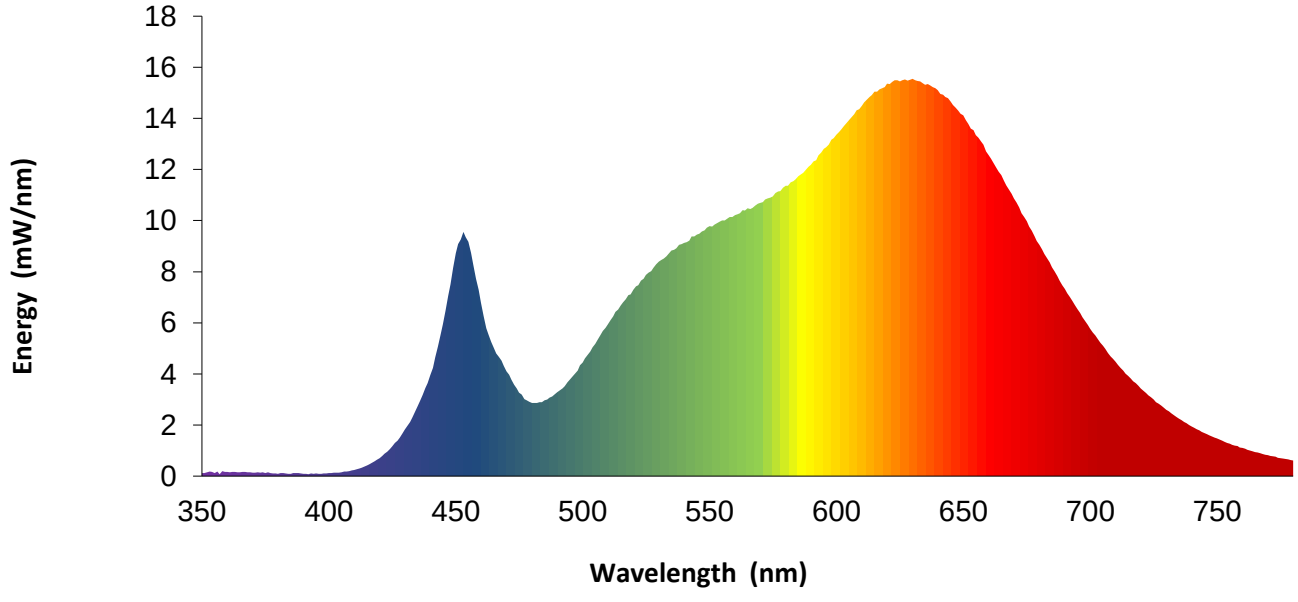
REPORT NO. 104659241CRT-011

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	6.8		570	10.7		680	9.1
355	0.1		465	5.0		575	10.9		685	8.2
360	0.2		470	4.1		580	11.4		690	7.3
365	0.2		475	3.3		585	11.7		695	6.5
370	0.1		480	2.9		590	12.2		700	5.8
375	0.1		485	3.0		595	12.8		705	5.1
380	0.1		490	3.3		600	13.4		710	4.5
385	0.1		495	3.8		605	13.9		715	3.9
390	0.1		500	4.4		610	14.5		720	3.4
395	0.1		505	5.2		615	15.0		725	3.0
400	0.1		510	5.9		620	15.4		730	2.6
405	0.2		515	6.7		625	15.5		735	2.2
410	0.2		520	7.3		630	15.5		740	1.9
415	0.4		525	7.9		635	15.3		745	1.7
420	0.7		530	8.4		640	15.1		750	1.5
425	1.2		535	8.8		645	14.7		755	1.3
430	1.8		540	9.1		650	14.1		760	1.1
435	2.7		545	9.5		655	13.4		765	0.9
440	4.0		550	9.8		660	12.6		770	0.8
445	5.9		555	10.0		665	11.8		775	0.7
450	8.7		560	10.2		670	10.9		780	0.6
455	9.2		565	10.5		675	10.0		---	---



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

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EQUIPMENT LIST

REPORT NO. 104659241CRT-011

#	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

REPORT NO. 104659241CRT-011

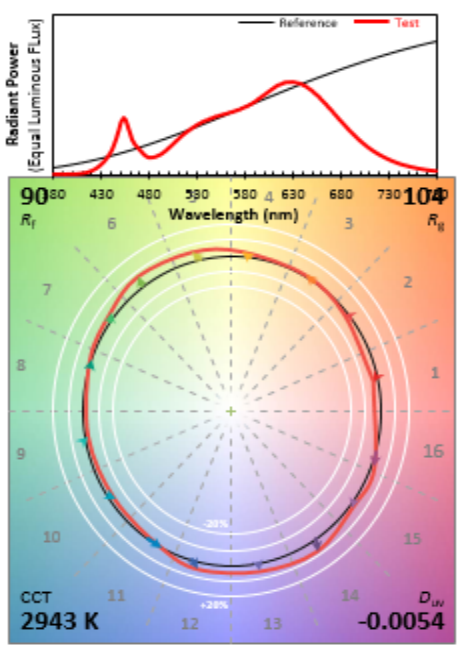
Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-WD31W-W	NA

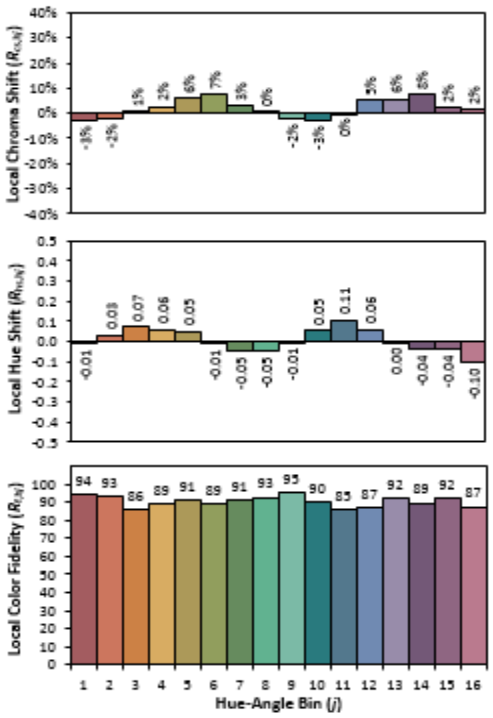
TM-30 REPORT

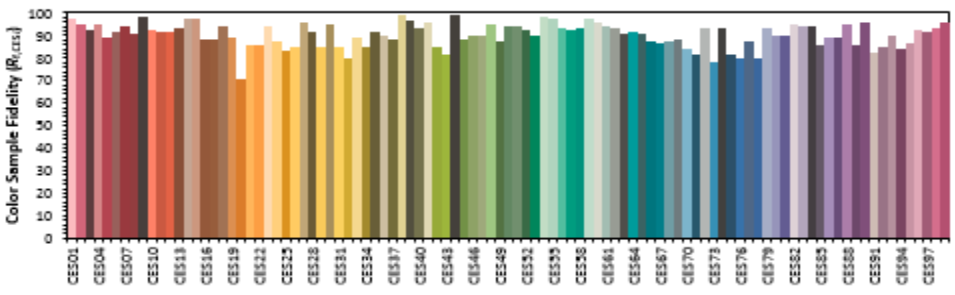
ANSI/IES TM-30-18 Color Rendition Report

Source: 104659241CRT-011 **Manufacturer:** VISUAL COMFORT AND COMPANY

Date: 8/25/2021 **Model:** ENCL2SF-L12I, ENCL2SFD-WD31W-W







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

x	**0.4331**
y	**0.3894**
u'	**0.2545**
v'	**0.5149**

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