

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ENCL2SF-L12I, ENCL2SFW-930W-W

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CRT-010

ISSUE DATE

8/31/2021

REVISED DATE

None

TEST DATES

8/19/21 through 8/31/21

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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PAGES

12

REPORT NUMBER

104659241CRT-010

MODEL NUMBER(s)

ENCL2SF-L12I, ENCL2SFW-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

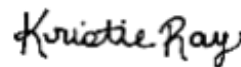
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Gerald Gray
Associate Engineer
Lighting Division



Kristie Ray
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SAMPLE INFORMATION

REPORT NO. 104659241CRT-010

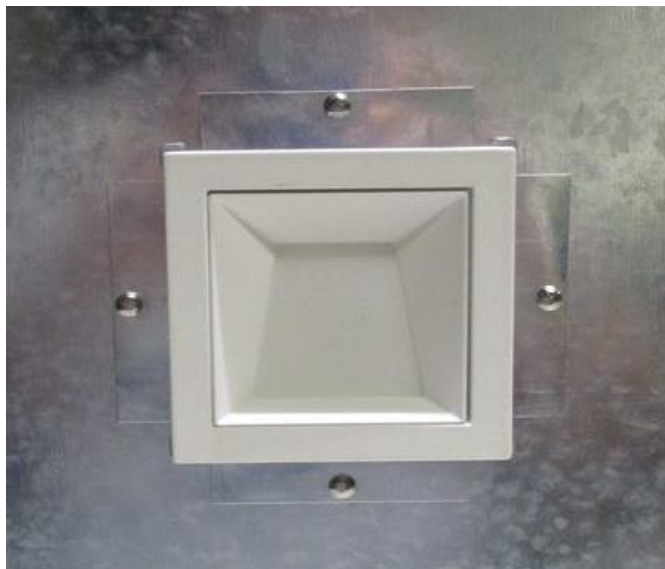
ITEMS RECEIVED

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	CRT2108131437-001-6	BXRE-30-G1000-C-83	LED	Production	8/13/2021
4	CRT2108131437-001-11	--	Reflector	Production	8/13/2021
5	CRT2108131437-001-12	--	Trim	Production	8/13/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCL2SF-L12I, ENCL2SFW-930W-W	1,2,3,4,5

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

REPORT NO. 104659241CRT-010

PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCL2SF-L12I, ENCL2SFW-930W-W
Product Description:	12 Watt, Wall Wash, 3000K
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)	611.7	628.0
Input Power (W) @ 120 (Vac)	10.77	10.91
Lumen Efficacy (lm/W)	56.8	57.6
Input Power Factor (I) @ 120 (Vac)	0.983	0.981

Criteria	Results
Input ATHD (%) @ 120 (Vac)	15.31
Correlated Color Temperature (K)	2888
Color Rendering Index - Ra (I)	89.9
Color Rendering Index - R9 (I)	62.5
Duv (I)	0.0003
Chromaticity Coordinate (x)	0.445
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.255
Chromaticity Coordinate (v')	0.524

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-010

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFW-930W-W	NA

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

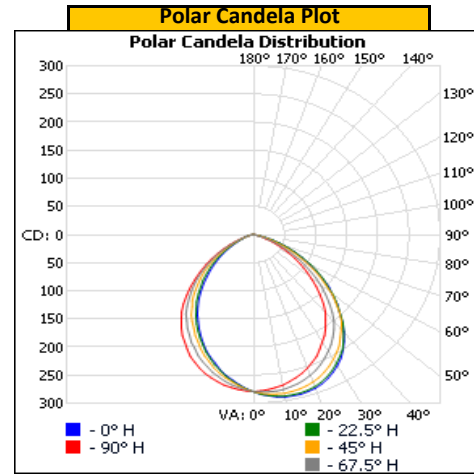
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.02	91.3	10.77	0.983

Light Output (lm)	Lumen Efficacy (lm/W)
611.7	56.8

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	279	279	279	279	279
5	288	287	284	280	276
10	293	292	286	280	272
15	294	291	284	274	263
20	291	288	279	266	253
25	282	279	270	255	240
30	269	266	256	240	221
35	251	249	240	222	202
40	226	226	219	201	180
45	196	196	196	172	151
50	164	168	165	142	122
55	135	137	130	110	93
60	102	105	96	79	66
65	72	74	65	50	41
70	44	45	38	27	21
75	21	21	17	11	9
80	3	4	4	4	3
85	0	0	0	1	1
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



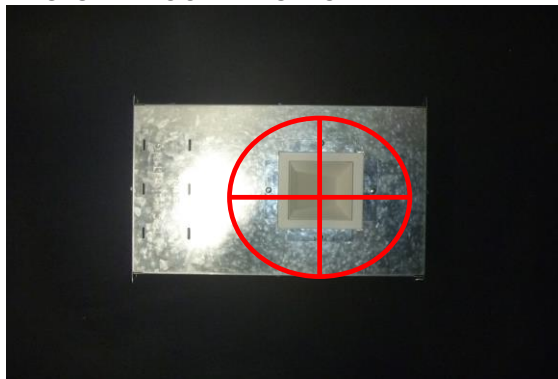
REPORT NO. 104659241CRT-010

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

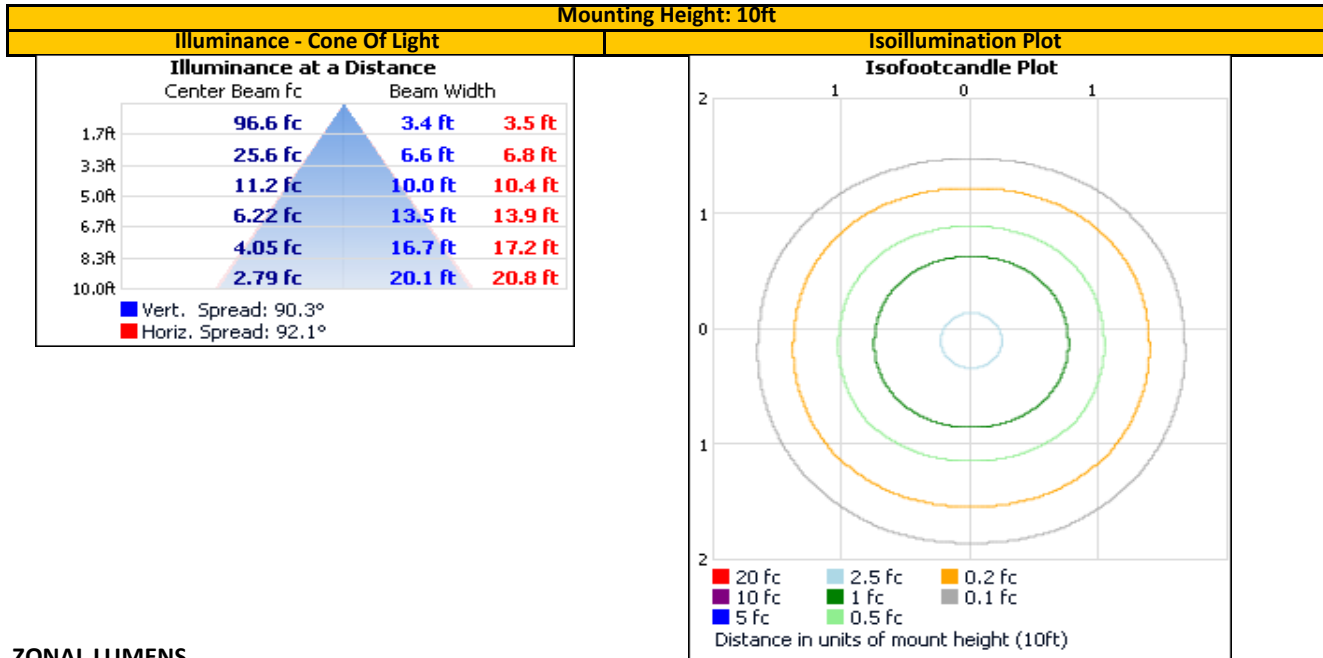
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



REPORT NO. 104659241CRT-010

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary								
Zone	Lumens	Luminaire	Zone	Lumens	Total	Zone	Lumens	Total
0-30	211.3	34.5%	0-10	26.3	4.3%	90-100	0.0	0.0%
0-40	339.0	55.4%	10-20	74.6	12.2%	100-110	0.0	0.0%
0-60	548.3	89.6%	20-30	110.5	18.1%	110-120	0.0	0.0%
60-90	63.5	10.4%	30-40	127.7	20.9%	120-130	0.0	0.0%
70-100	16.3	2.7%	40-50	120.1	19.6%	130-140	0.0	0.0%
90-120	0.0	0.0%	50-60	89.1	14.6%	140-150	0.0	0.0%
0-90	611.7	100.0%	60-70	47.1	7.7%	150-160	0.0	0.0%
90-180	0.0	0.0%	70-80	14.7	2.4%	160-170	0.0	0.0%
0-180	611.7	100.0%	80-90	1.7	0.3%	170-180	0.0	0.0%

REPORT NO. 104659241CRT-010

UNIFIED GLARE RATING (UGR) SUMMARY

Reflectances					
Ceiling Cavity	70	70	50	50	30
Walls	50	30	50	30	30
Floor Cavity	20	20	20	20	20

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Crosswise				
26.8	28.3	27.2	28.6	29.0
27.8	29.1	28.2	29.5	29.8
28.0	29.2	28.4	29.6	29.9
28.0	29.1	28.4	29.5	29.9
27.9	29.0	28.4	29.4	29.8
27.9	28.9	28.3	29.3	29.8

4H	2H
	3H
	4H
	6H
	8H
	12H

27.1	28.4	27.5	28.7	29.1
28.2	29.2	28.6	29.6	30.0
28.4	29.3	28.9	29.8	30.2
28.5	29.2	28.9	29.7	30.1
28.4	29.1	28.9	29.6	30.1
28.4	29.0	28.9	29.5	30.0

8H	4H
	6H
	8H
	12H

28.4	29.1	28.9	29.6	30.1
28.4	29.0	28.9	29.5	30.0
28.4	28.9	28.9	29.4	29.9
28.3	28.8	28.9	29.3	29.9

12H	4H
	6H
	8H

28.4	29.0	28.8	29.5	30.0
28.4	28.9	28.9	29.4	29.9
28.3	28.8	28.9	29.3	29.9

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Endwise				
24.3	25.8	24.6	26.1	26.4
24.8	26.2	25.2	26.5	26.8
24.9	26.1	25.3	26.5	26.8
24.9	26.0	25.3	26.4	26.8
24.8	25.9	25.2	26.3	26.7
24.8	25.8	25.2	26.2	26.6

4H	2H
	3H
	4H
	6H
	8H
	12H

24.7	25.9	25.1	26.3	26.7
25.4	26.4	25.8	26.8	27.2
25.4	26.3	25.8	26.7	27.2
25.4	26.2	25.9	26.6	27.1
25.4	26.1	25.9	26.6	27.0
25.3	26.0	25.8	26.5	27.0

8H	4H
	6H
	8H
	12H

25.5	26.2	25.9	26.6	27.1
25.5	26.1	26.0	26.6	27.0
25.4	26.0	25.9	26.5	27.0
25.4	25.9	25.9	26.4	26.9

12H	4H
	6H
	8H

25.4	26.1	25.9	26.6	27.0
25.4	26.0	25.9	26.4	27.0
25.4	25.9	25.9	26.4	26.9

Maximum UGR	
30.2	

INTEGRATING SPHERE TESTING

REPORT NO. 104659241CRT-010

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFW-930W-W	NA

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

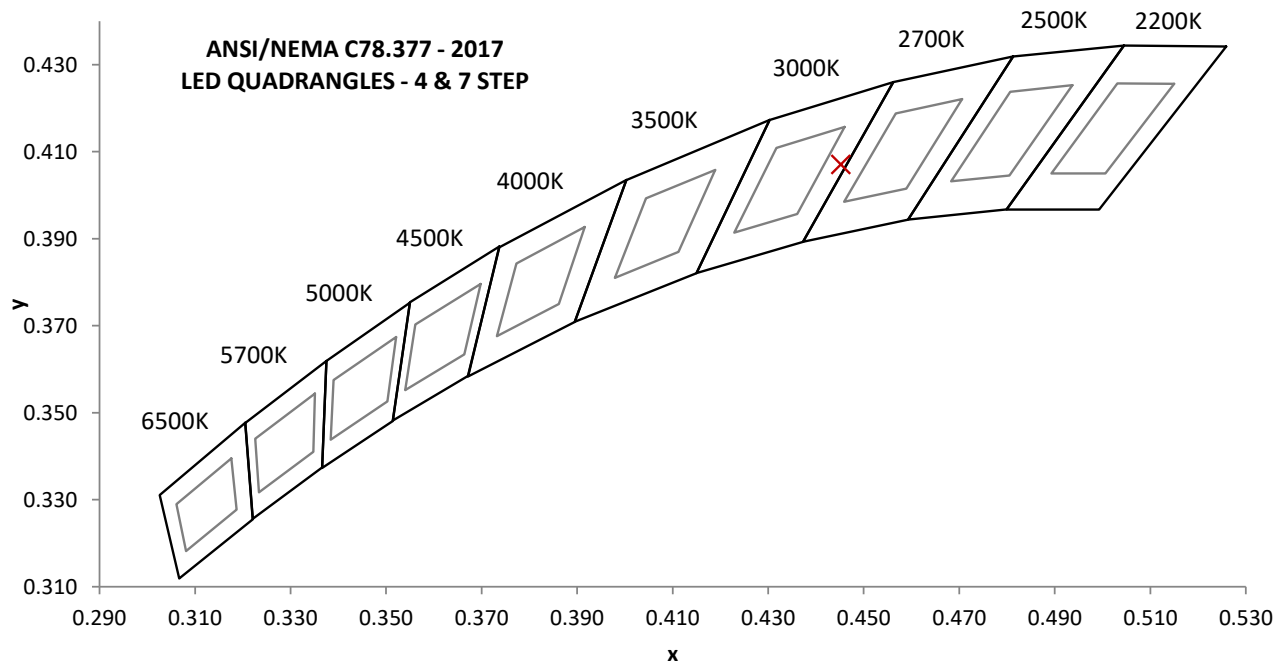
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.03	92.7	10.91	0.981	15.31

Measured at 120.03(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
628.0	57.6	2888	89.9	62.5

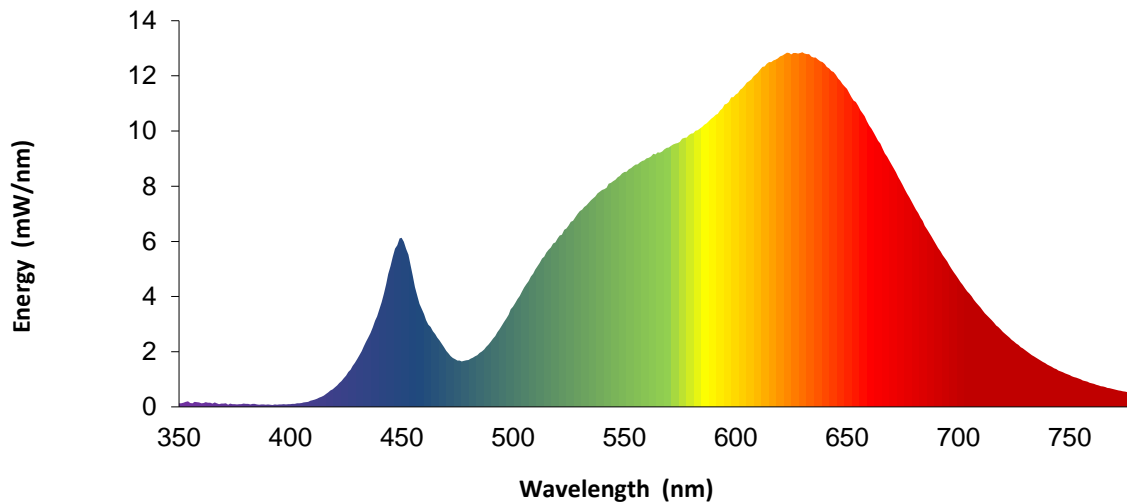
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0003	0.445	0.407	0.255	0.524



REPORT NO. 104659241CRT-010

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	3.4		570	9.4		680	7.3
355	0.1		465	2.6		575	9.6		685	6.6
360	0.1		470	2.0		580	9.9		690	5.9
365	0.1		475	1.7		585	10.2		695	5.3
370	0.1		480	1.7		590	10.5		700	4.6
375	0.1		485	2.0		595	11.0		705	4.1
380	0.1		490	2.4		600	11.3		710	3.6
385	0.1		495	3.0		605	11.8		715	3.1
390	0.1		500	3.6		610	12.1		720	2.7
395	0.1		505	4.3		615	12.5		725	2.4
400	0.1		510	5.0		620	12.7		730	2.1
405	0.1		515	5.6		625	12.8		735	1.8
410	0.2		520	6.1		630	12.9		740	1.5
415	0.4		525	6.6		635	12.7		745	1.3
420	0.7		530	7.1		640	12.4		750	1.2
425	1.1		535	7.5		645	12.0		755	1.0
430	1.7		540	7.9		650	11.5		760	0.8
435	2.5		545	8.2		655	10.9		765	0.7
440	3.5		550	8.5		660	10.2		770	0.6
445	5.1		555	8.8		665	9.5		775	0.6
450	6.1		560	9.0		670	8.8		780	0.5
455	4.8		565	9.2		675	8.0		---	---



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

SEE ANNEX A FOR TM-30 REPORT

EQUIPMENT LIST

REPORT NO. 104659241CRT-010

#	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-010

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFW-930W-W	NA

TM-30 REPORT

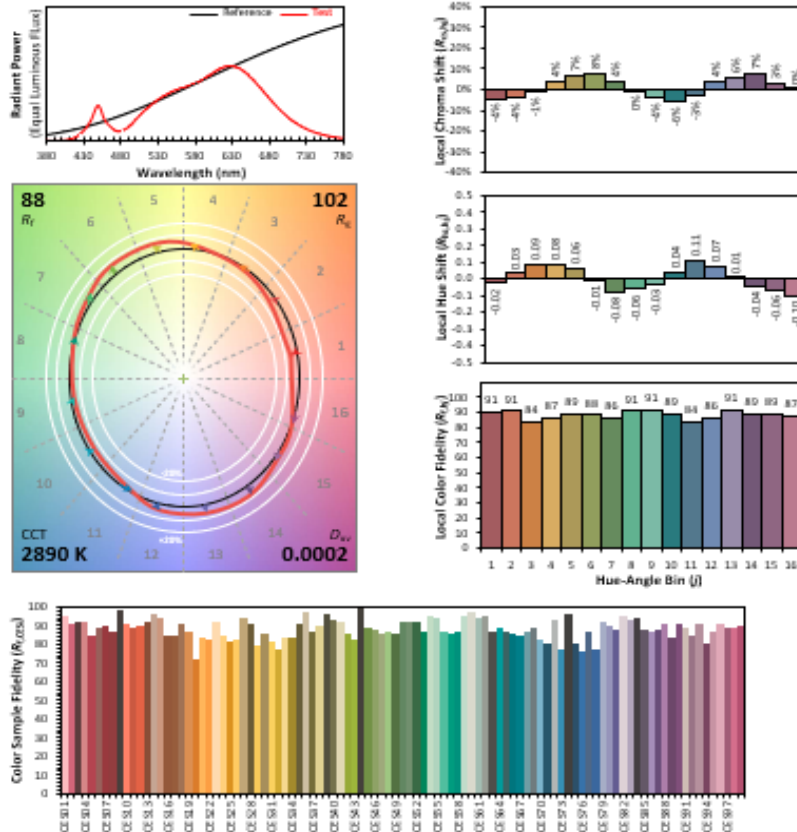
ANSI/IES TM-30-18 Color Rendition Report

Source: 104659241CRT-010

Manufacturer: VISUAL COMFORT
AND COMPANY

Date: 8/25/2021

Model: ENCL2SF-L12I, ENCL2SFW-930W-
W



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

R_e **0.4452**
 R_s **0.4072**
 U^* **0.2546**
 v^* **0.5238**

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