

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ENCL2SF-L08I, ENCL2SFW-930W-W

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CRT-009

ISSUE DATE

8/31/2021

REVISED DATE

None

TEST DATES

8/18/21 through 8/31/21

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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PAGES

12

REPORT NUMBER

104659241CRT-009

MODEL NUMBER(s)

ENCL2SF-L08I, 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

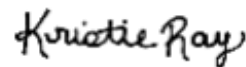
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Gerald Gray
Associate Engineer
Lighting Division



Kristie Ray
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SAMPLE INFORMATION

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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	CRT2108131437-001-6	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-L08I, ENCL2SFW-930W-W	1,2,3,4,5

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ENCL2SF-L08I, ENCL2SFW-930W-W
Product Description:	8 Watt, Wall Wash, 3000K
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)	444.3	453.2
Input Power (W) @ 120 (Vac)	7.37	7.45
Lumen Efficacy (lm/W)	60.2	60.8
Input Power Factor (I) @ 120 (Vac)	0.983	0.982

Criteria	Results
Input ATHD (%) @ 120 (Vac)	12.57
Correlated Color Temperature (K)	2894
Color Rendering Index - Ra (I)	90.1
Color Rendering Index - R9 (I)	64.8
Duv (I)	0.0002
Chromaticity Coordinate (x)	0.446
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.254
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

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFW-930W-W	NA

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

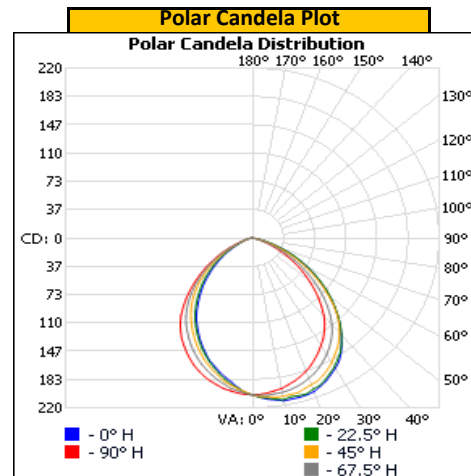
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.04	62.5	7.37	0.983

Light Output (lm)	Lumen Efficacy (lm/W)
444.3	60.2

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	203	203	203	203	203
5	210	208	206	204	202
10	214	212	208	203	198
15	214	211	207	200	192
20	212	208	202	193	184
25	205	202	196	186	173
30	195	193	187	174	161
35	182	180	174	162	148
40	163	163	159	146	131
45	142	143	141	125	110
50	120	120	118	102	88
55	96	98	93	80	68
60	74	76	69	57	48
65	52	53	46	36	30
70	31	32	27	19	16
75	15	15	12	8	7
80	2	3	3	2	2
85	0	0	0	0	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



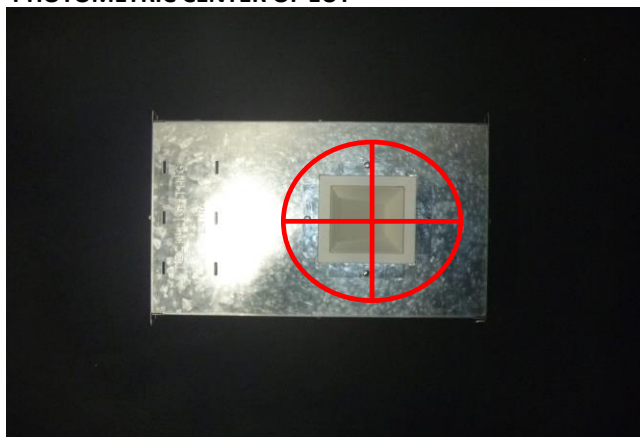
REPORT NO. 104659241CRT-009

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

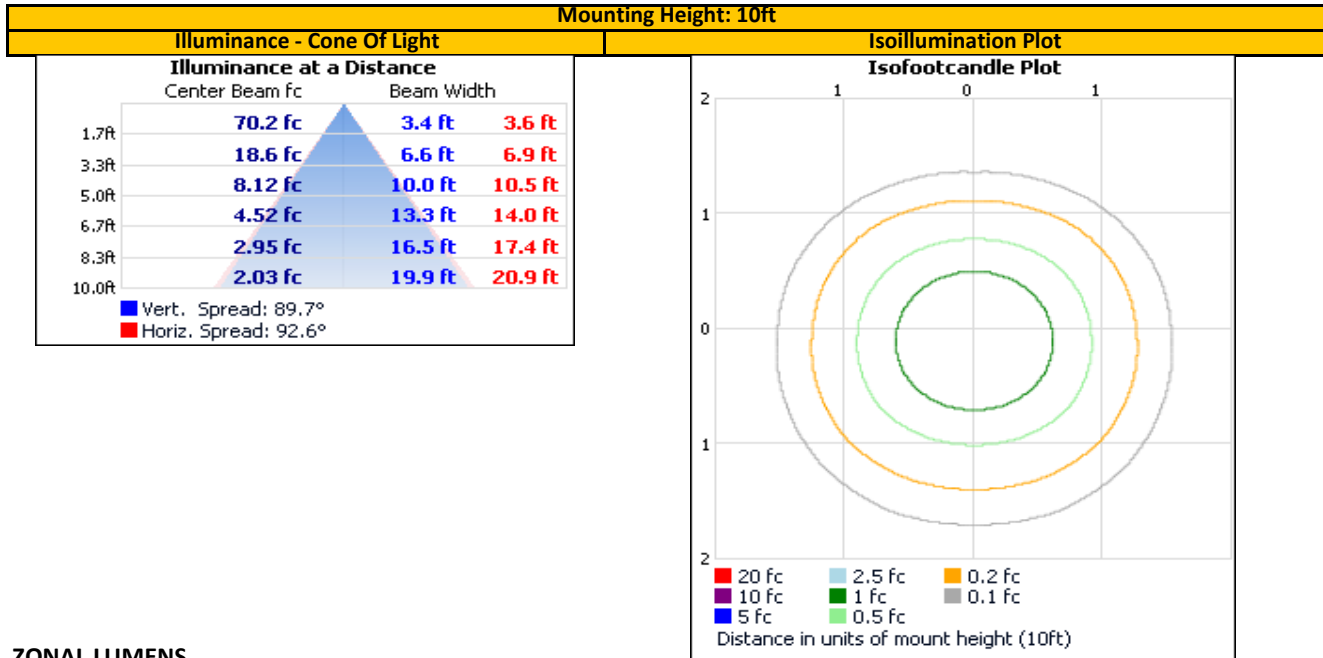
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	153.7	34.6%	0-10	19.1	4.3%
0-40	246.6	55.5%	10-20	54.2	12.2%
0-60	398.5	89.7%	20-30	80.4	18.1%
60-90	45.8	10.3%	30-40	92.9	20.9%
70-100	11.6	2.6%	40-50	87.3	19.6%
90-120	0.0	0.0%	50-60	64.7	14.6%
0-90	444.3	100.0%	60-70	34.1	7.7%
90-180	0.0	0.0%	70-80	10.5	2.4%
0-180	444.3	100.0%	80-90	1.2	0.3%
			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%

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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				
25.7	27.2	26.0	27.5	27.8
26.6	27.9	27.0	28.3	28.6
26.8	28.0	27.2	28.4	28.7
26.8	27.9	27.2	28.3	28.7
26.7	27.8	27.2	28.2	28.6
26.7	27.7	27.1	28.1	28.5

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

25.9	27.2	26.3	27.5	27.9
27.0	28.0	27.4	28.4	28.8
27.2	28.1	27.6	28.5	29.0
27.2	28.0	27.7	28.5	28.9
27.2	27.9	27.7	28.4	28.8
27.2	27.8	27.6	28.3	28.8

8H	4H
	6H
	8H
	12H

27.2	27.9	27.7	28.4	28.8
27.2	27.8	27.7	28.3	28.8
27.1	27.7	27.7	28.2	28.7
27.1	27.6	27.6	28.1	28.6

12H	4H
	6H
	8H

27.2	27.8	27.7	28.3	28.8
27.2	27.7	27.7	28.2	28.7
27.1	27.6	27.6	28.1	28.6

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

UGR Viewed Endwise				
23.2	24.7	23.6	25.0	25.3
23.7	25.1	24.1	25.4	25.8
23.8	25.0	24.2	25.4	25.8
23.8	24.9	24.2	25.3	25.7
23.7	24.8	24.2	25.2	25.6
23.7	24.7	24.1	25.1	25.6

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

23.6	24.8	24.0	25.2	25.6
24.2	25.3	24.7	25.7	26.1
24.3	25.2	24.7	25.6	26.1
24.3	25.1	24.8	25.5	26.0
24.3	25.0	24.7	25.5	25.9
24.3	24.9	24.7	25.4	25.8

8H	4H
	6H
	8H
	12H

24.4	25.1	24.8	25.5	26.0
24.3	24.9	24.8	25.4	25.9
24.3	24.8	24.8	25.4	25.9
24.3	24.8	24.8	25.3	25.8

12H	4H
	6H
	8H

24.3	25.0	24.8	25.5	25.9
24.3	24.9	24.8	25.3	25.9
24.3	24.8	24.8	25.3	25.8

Maximum UGR	
29.0	

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFW-930W-W	NA

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

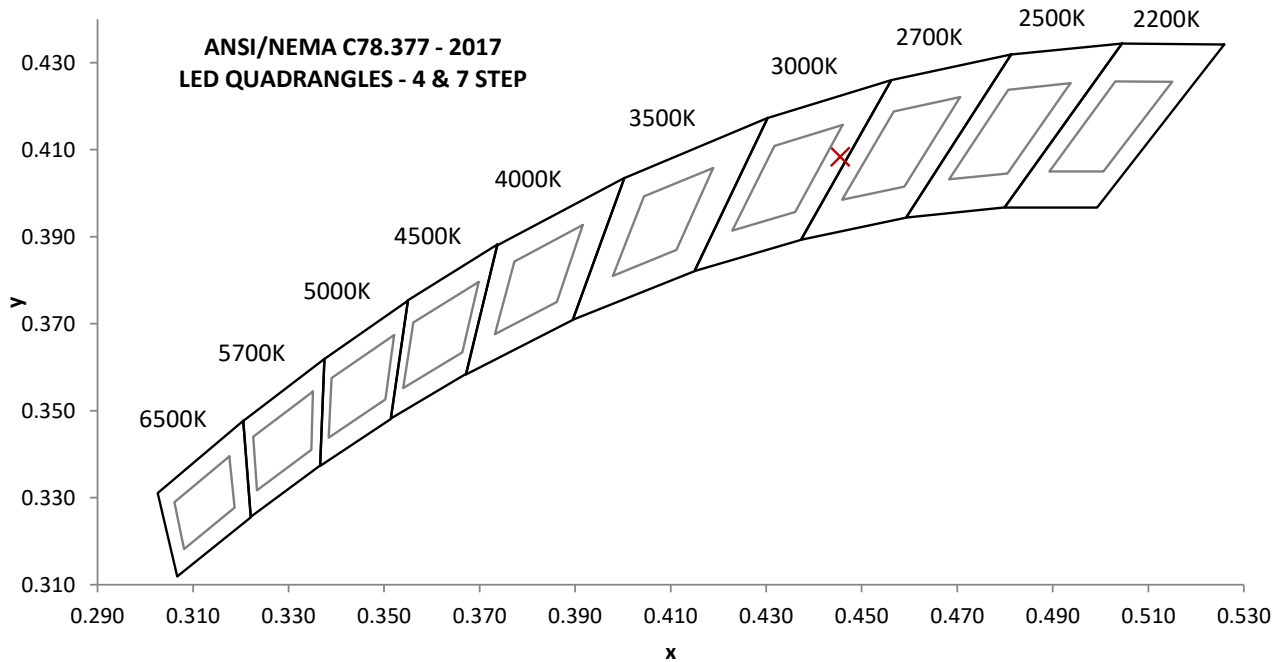
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.01	63.2	7.45	0.982	12.57

Measured at 120.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
453.2	60.8	2894	90.1	64.8

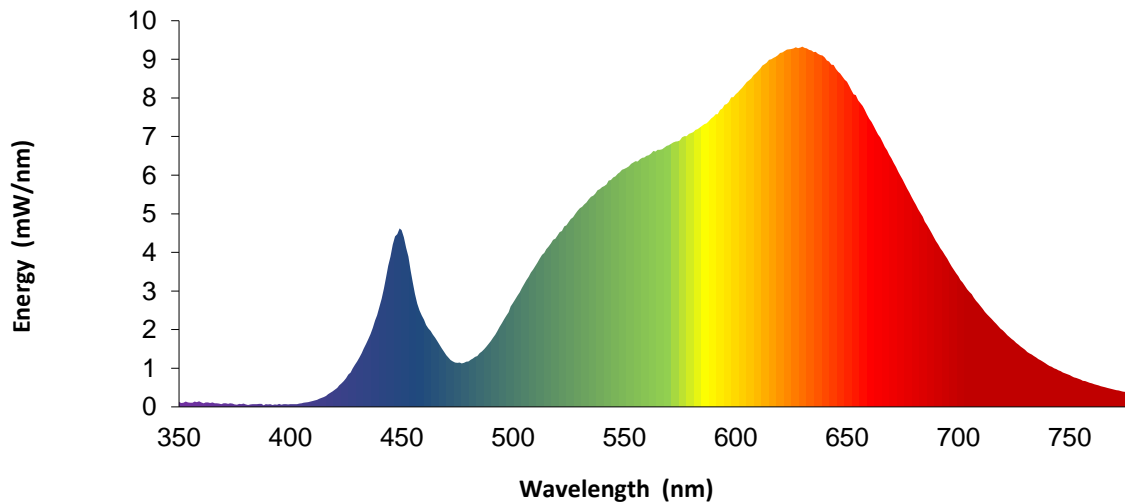
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0002	0.446	0.408	0.254	0.524



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	2.3		570	6.8		680	5.3
355	0.1		465	1.8		575	6.9		685	4.8
360	0.1		470	1.3		580	7.1		690	4.3
365	0.1		475	1.1		585	7.3		695	3.8
370	0.1		480	1.2		590	7.5		700	3.4
375	0.1		485	1.4		595	7.8		705	3.0
380	0.1		490	1.7		600	8.1		710	2.6
385	0.1		495	2.2		605	8.4		715	2.3
390	0.1		500	2.7		610	8.7		720	2.0
395	0.1		505	3.2		615	9.0		725	1.7
400	0.1		510	3.6		620	9.2		730	1.5
405	0.1		515	4.1		625	9.3		735	1.3
410	0.2		520	4.4		630	9.3		740	1.1
415	0.3		525	4.8		635	9.2		745	0.9
420	0.4		530	5.1		640	9.0		750	0.8
425	0.7		535	5.4		645	8.8		755	0.7
430	1.2		540	5.7		650	8.4		760	0.6
435	1.8		545	5.9		655	7.9		765	0.5
440	2.6		550	6.2		660	7.5		770	0.4
445	3.9		555	6.4		665	7.0		775	0.4
450	4.6		560	6.5		670	6.4		780	0.3
455	3.2		565	6.7		675	5.9		---	---



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-009

#	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-009

Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFw-930W-W	NA

TM-30 REPORT

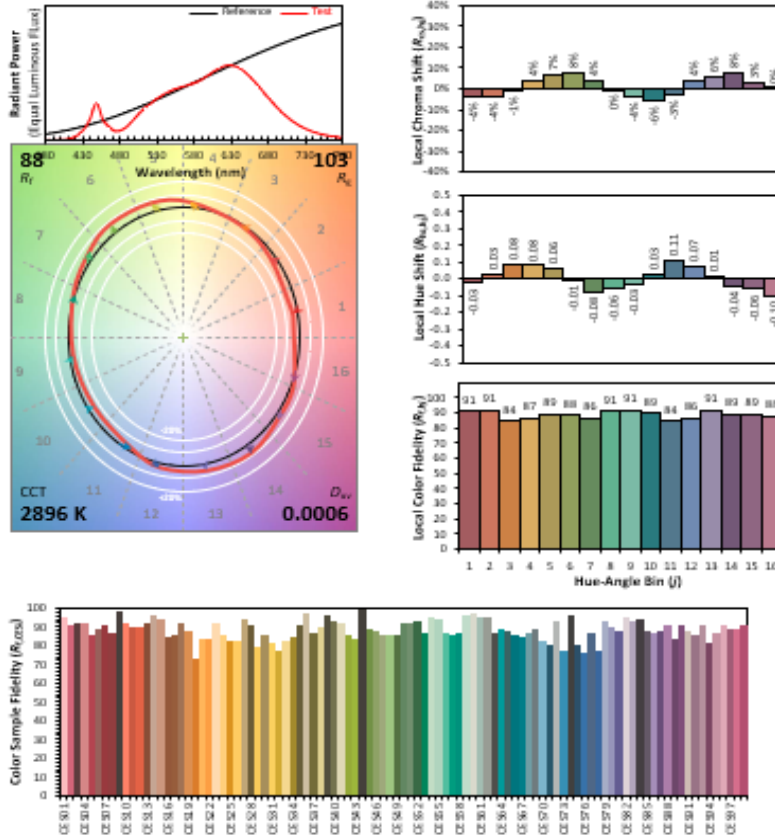
ANSI/IES TM-30-18 Color Rendition Report

Source: 104659241CRT-009

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 8/31/2021

Model: ENCL2SF-L08I, ENCL2SFw-930W-W



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

R_e **0.4455**
 R_s **0.4084**
 R_v **0.2542**
 $R_{v'}$ **0.5244**

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