

# 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-016

**ISSUE DATE**

8/25/2021

**REVISED DATE**

None

**TEST DATES**

8/23/21 through 8/24/21

**DOCUMENT CONTROL NUMBER**

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

104659241CRT-016

**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-016**

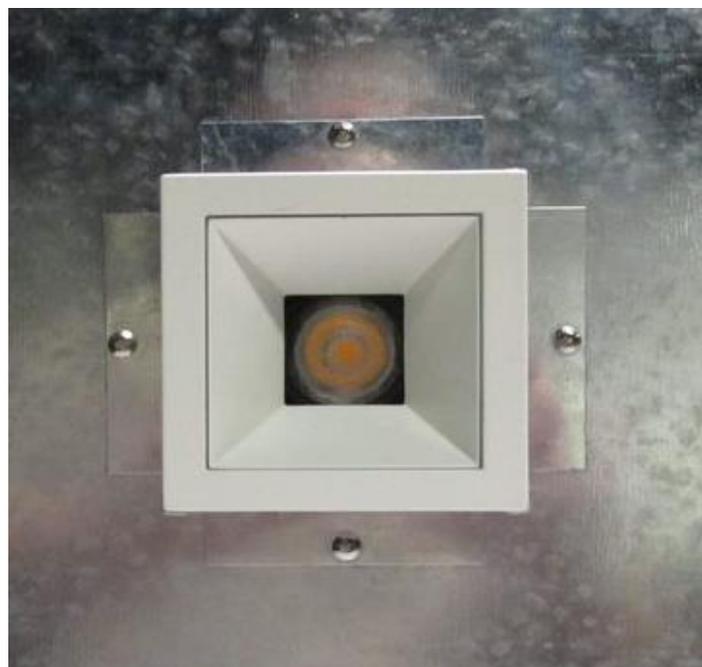
**ITEMS RECEIVED**

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	CRT2108131437-001-18	--	60° 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**

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**PRODUCT INFORMATION AND SUMMARY OF DATA**

Product Model No.:	ENCL2SF-L12I, ENCL2SFD-930W-W
Product Description:	12 Watt, 60° 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)	942.2	967.7
Input Power (W) @ 120 (Vac)	10.84	10.87
Lumen Efficacy (lm/W)	86.9	89.0
Input Power Factor ( ) @ 120 (Vac)	0.983	0.981

Criteria	Results
Input ATHD (%) @ 120 (Vac)	15.54
Correlated Color Temperature (K)	3015
Color Rendering Index - Ra ( )	92.0
Color Rendering Index - R9 ( )	72.2
Duv ( )	0.0006
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.402
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.520

**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-930W-W	NA

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

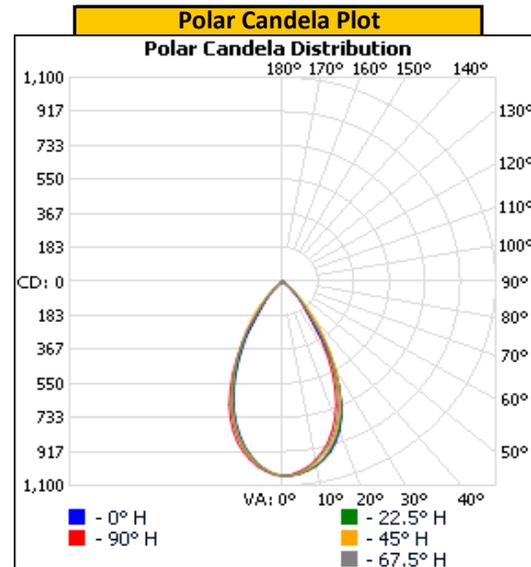
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.01	91.9	10.84	0.983

Light Output (lm)	Lumen Efficacy (lm/W)
942.2	86.9

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	1046	1046	1046	1046	1046
5	1041	1040	1038	1031	1026
10	1009	1006	997	984	976
15	951	942	929	914	900
20	857	849	833	814	788
25	715	709	704	672	641
30	533	539	544	504	467
35	278	338	383	323	258
40	169	178	247	172	153
45	78	102	122	101	82
50	12	15	65	26	14
55	10	10	14	11	12
60	8	8	8	9	9
65	5	6	6	6	7
70	3	3	4	4	4
75	1	1	2	2	2
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



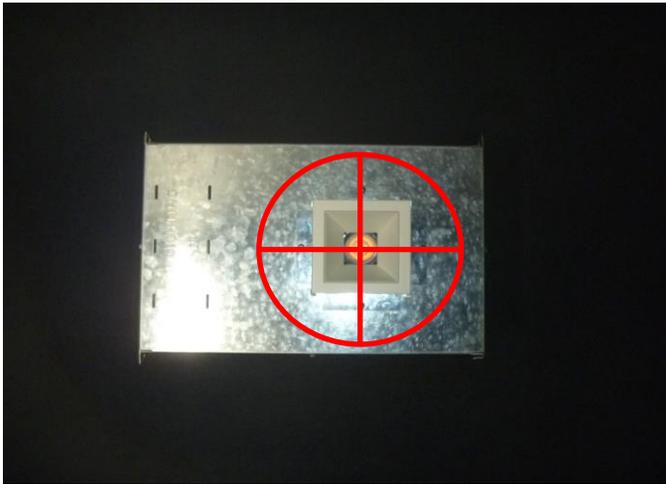
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**ORIENTATION AND ALIGNMENT OF EUT**

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

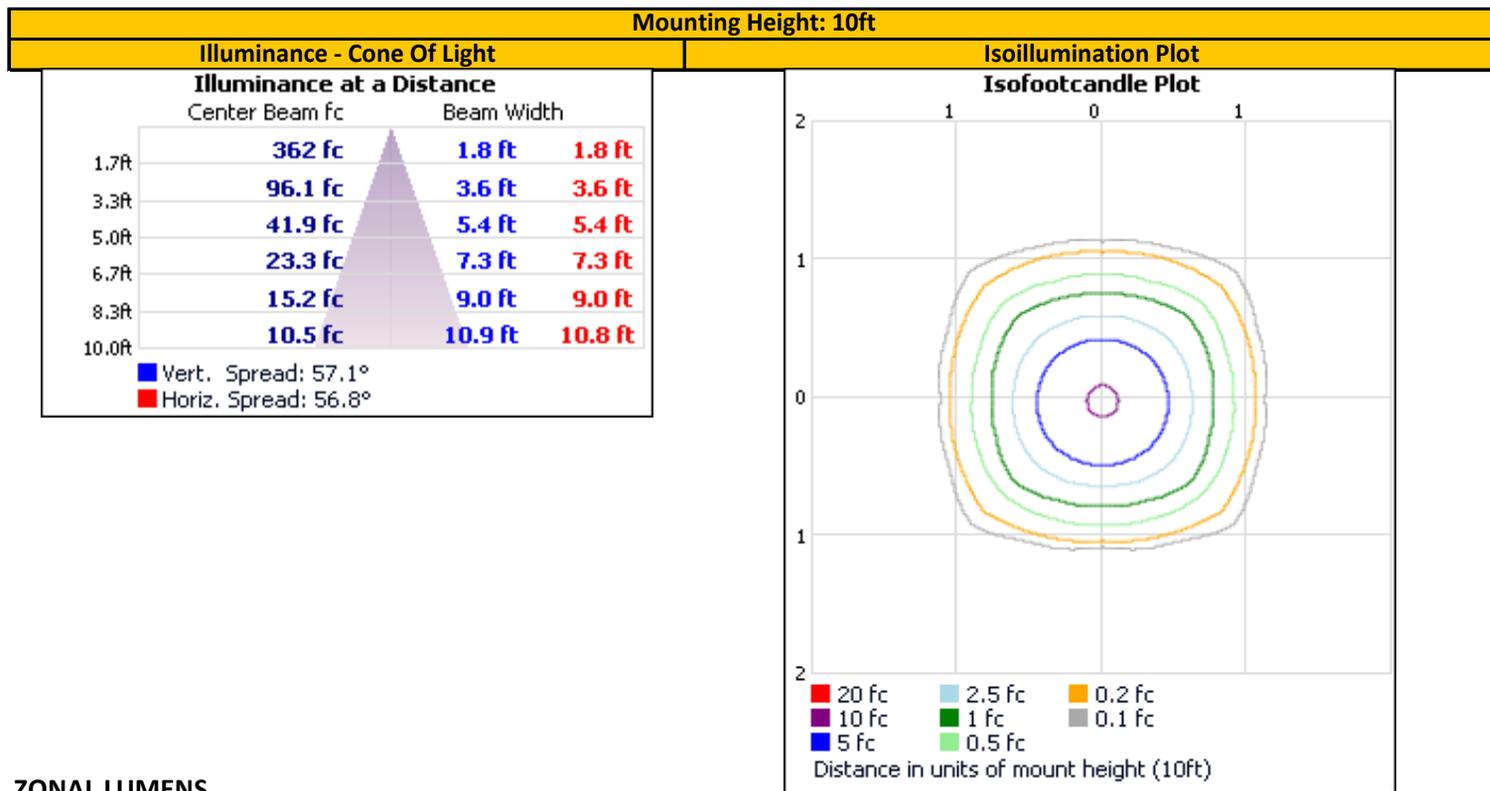
Test Distance (ft)
29.6

**PHOTOMETRIC CENTER OF EUT**



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**ILLUMINANCE SUMMARY**



**ZONAL LUMENS**

Zonal Lumen Summary					
Zone	Lumens	Luminaire			
0-30	641.8	68.1%			
0-40	839.8	89.1%			
0-60	932.3	99.0%			
60-90	9.8	1.0%			
70-100	2.6	0.3%			
90-120	0.0	0.0%			
0-90	942.2	100.0%			
90-180	0.0	0.0%			
0-180	942.2	100.0%			
Zone	Lumens	Total	Zone	Lumens	Total
0-10	96.4	10.2%	90-100	0.0	0.0%
10-20	250.6	26.6%	100-110	0.0	0.0%
20-30	294.8	31.3%	110-120	0.0	0.0%
30-40	197.9	21.0%	120-130	0.0	0.0%
40-50	77.6	8.2%	130-140	0.0	0.0%
50-60	15.0	1.6%	140-150	0.0	0.0%
60-70	7.2	0.8%	150-160	0.0	0.0%
70-80	2.6	0.3%	160-170	0.0	0.0%
80-90	0.1	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-930W-W	NA

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

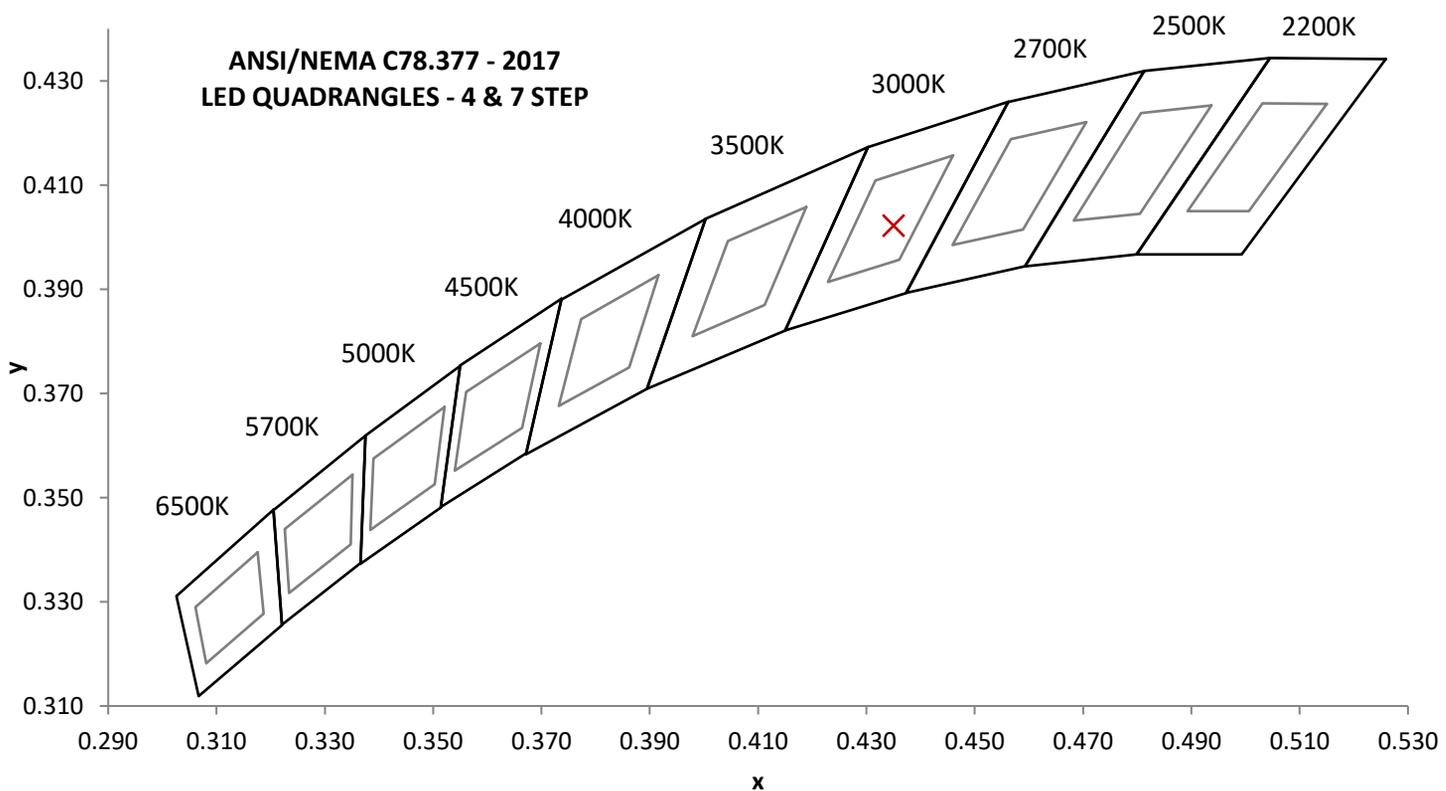
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.02	92.3	10.87	0.981	15.54

**Measured at 120.02(Vac)**

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
967.7	89.0	3015	92.0	72.2

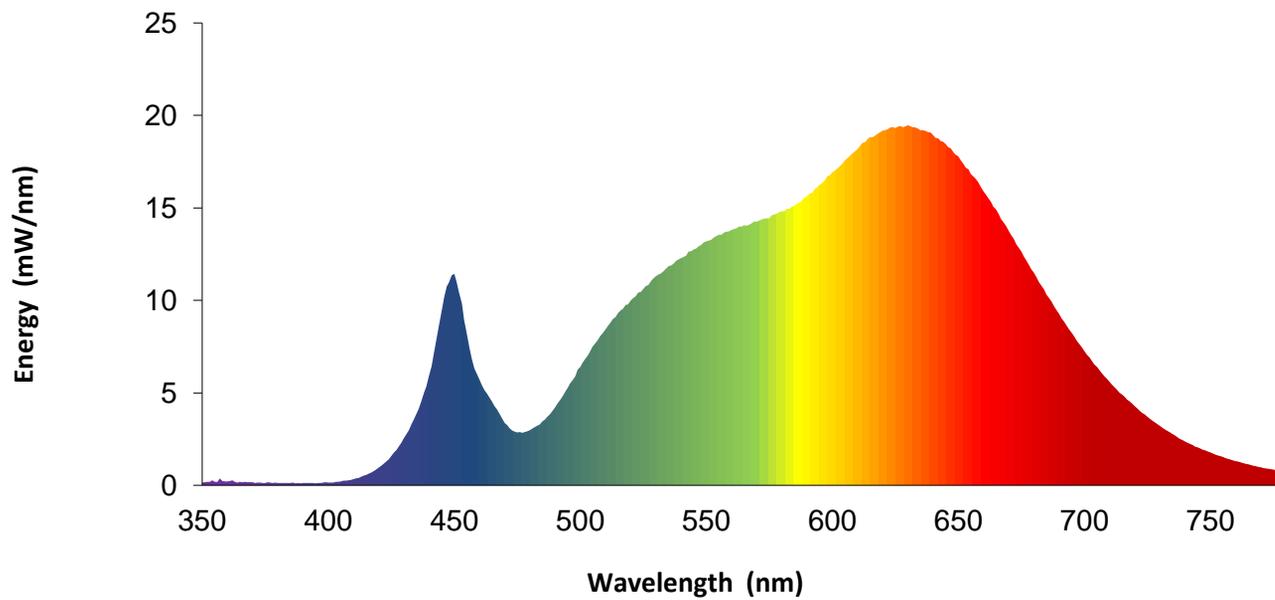
Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0006	0.435	0.402	0.250	0.520



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**SPECTRAL DISTRIBUTION OVER WAVELENGTHS**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.2	460	5.7	570	14.3	680	11.5
355	0.2	465	4.5	575	14.4	685	10.3
360	0.2	470	3.4	580	14.8	690	9.3
365	0.2	475	2.8	585	15.1	695	8.2
370	0.2	480	3.0	590	15.6	700	7.3
375	0.1	485	3.5	595	16.3	705	6.4
380	0.1	490	4.2	600	16.9	710	5.6
385	0.1	495	5.3	605	17.6	715	4.9
390	0.1	500	6.4	610	18.2	720	4.3
395	0.1	505	7.5	615	18.8	725	3.7
400	0.1	510	8.4	620	19.2	730	3.2
405	0.2	515	9.3	625	19.3	735	2.8
410	0.3	520	10.0	630	19.5	740	2.4
415	0.6	525	10.6	635	19.2	745	2.0
420	1.0	530	11.3	640	18.9	750	1.8
425	1.6	535	11.8	645	18.5	755	1.5
430	2.5	540	12.3	650	17.8	760	1.3
435	3.9	545	12.7	655	16.8	765	1.1
440	5.9	550	13.2	660	15.9	770	1.0
445	9.4	555	13.5	665	14.9	775	0.8
450	11.4	560	13.8	670	13.8	780	0.7
455	8.2	565	14.1	675	12.6	---	---



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**

**REPORT NO. 104659241CRT-016**

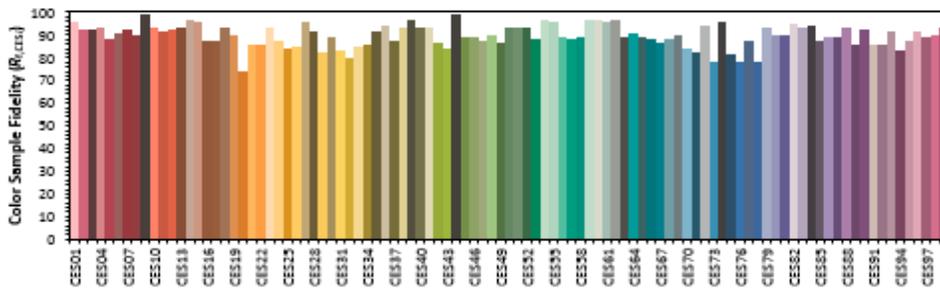
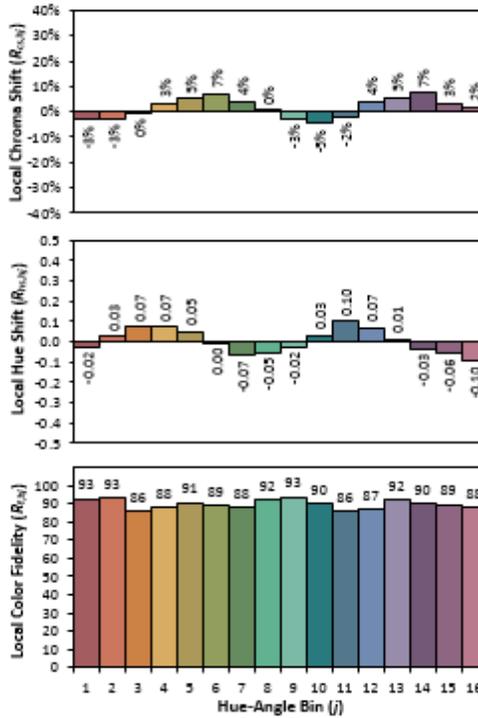
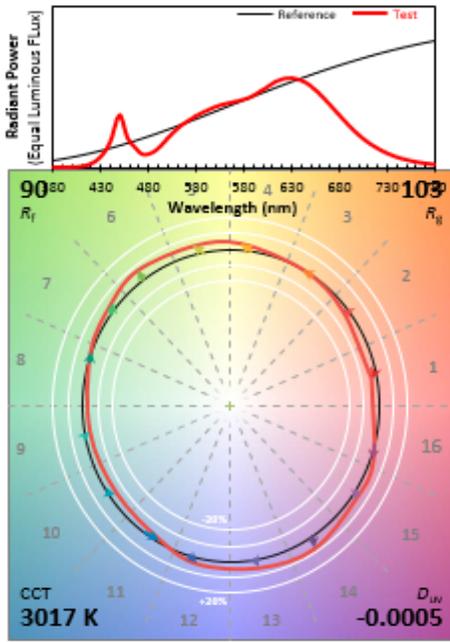
Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L12I, ENCL2SFD-930W-W	NA

**TM-30 REPORT**

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

Source: 104659241CRT-016  
Date: 8/25/2021

Manufacturer: VISUAL COMFORT AND COMPANY  
Model: ENCL2SF-L12I, ENCL2SFD-930W-W



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

x 0.4350  
y 0.4022  
u' 0.2501  
v' 0.5204

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