

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:



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Reviewer:



Jeff Davis
Technical Lead
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SAMPLE INFORMATION

REPORT NO. 104659241CRT-016

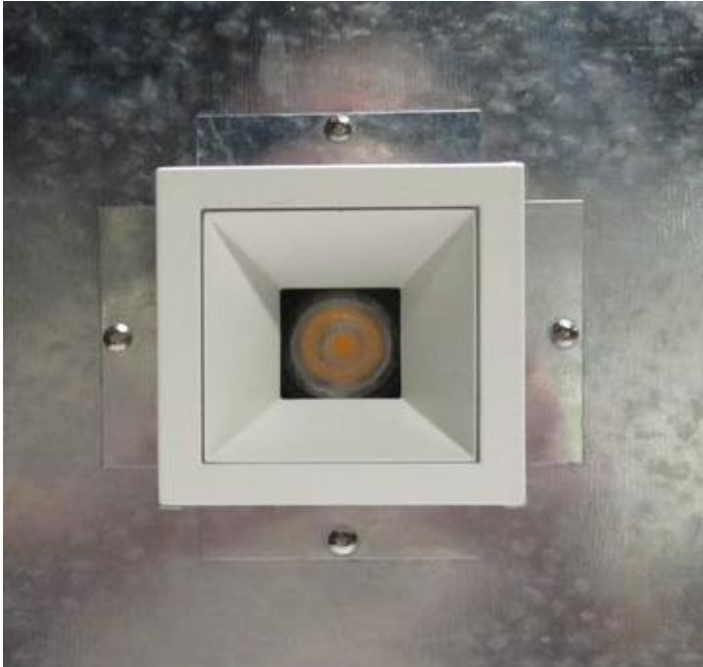
ITEMS RECEIVED

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

REPORT NO. 104659241CRT-016

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 (I) @ 120 (Vac)	0.983	0.981

Criteria	Results
Input ATHD (%) @ 120 (Vac)	15.54
Correlated Color Temperature (K)	3015
Color Rendering Index - Ra (I)	92.0
Color Rendering Index - R9 (I)	72.2
Duv (I)	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

REPORT NO. 104659241CRT-016

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

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

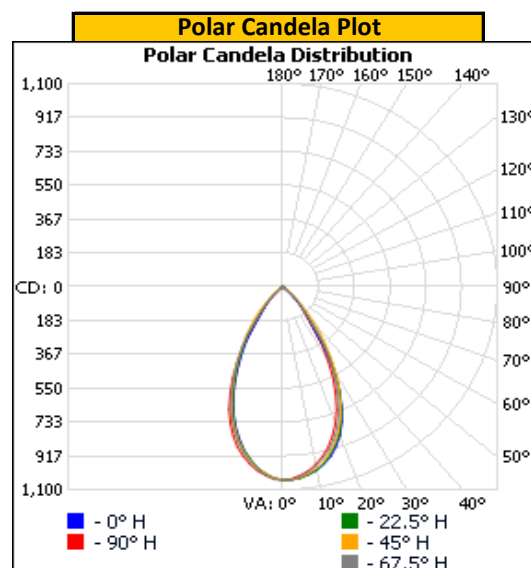
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.01	91.9	10.84	0.983

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



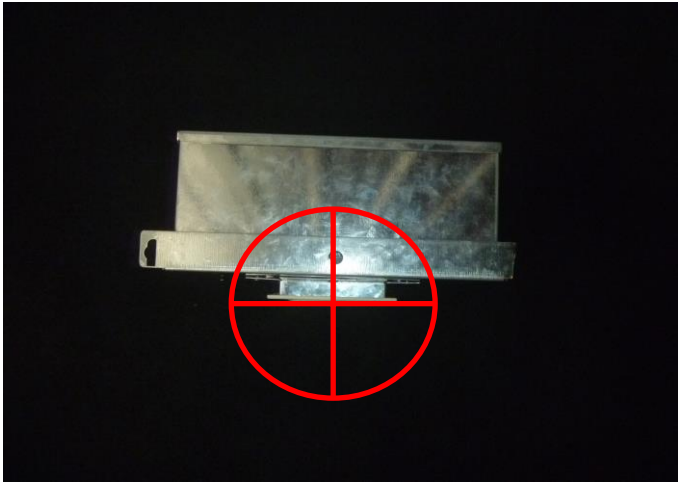
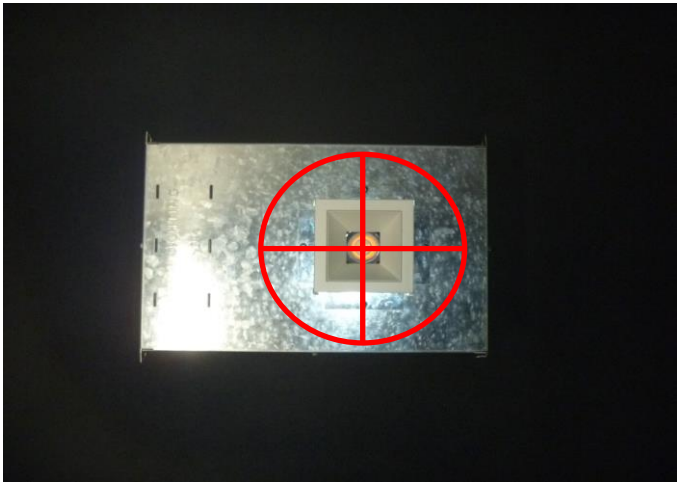
REPORT NO. 104659241CRT-016

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

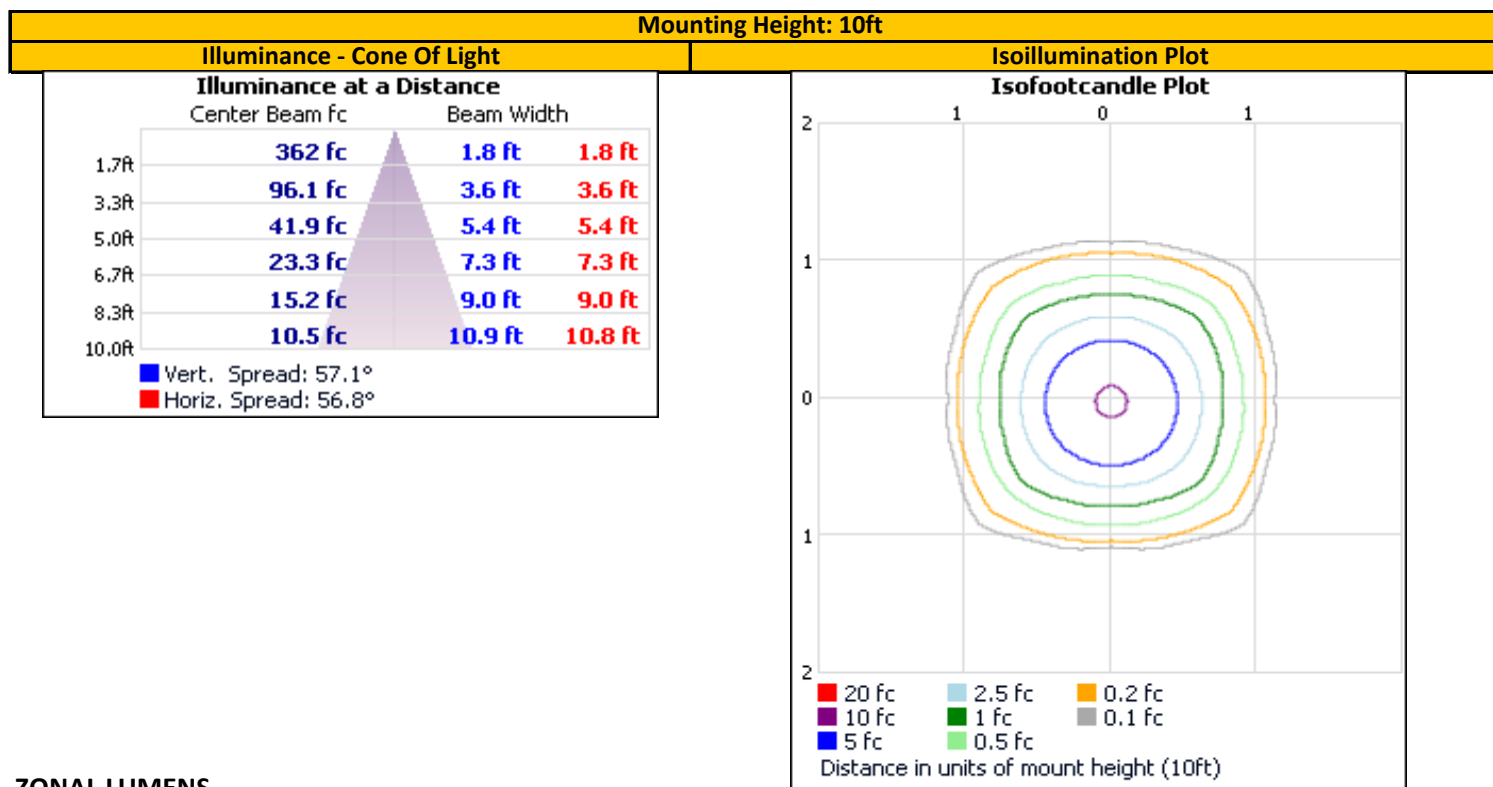
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



REPORT NO. 104659241CRT-016

ILLUMINANCE SUMMARY



ZONAL LUMENS

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

REPORT NO. 104659241CRT-016

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

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

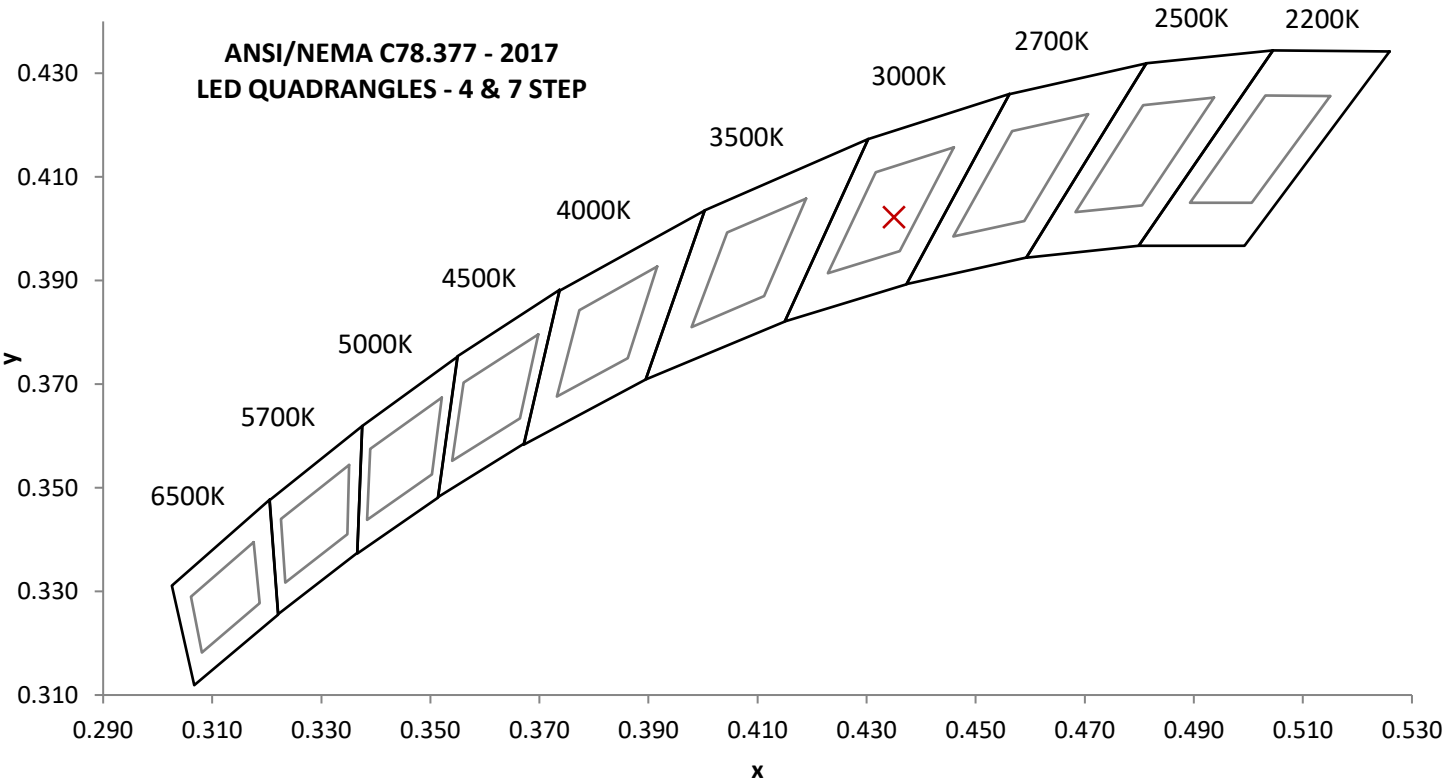
Base Orientation
Up

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

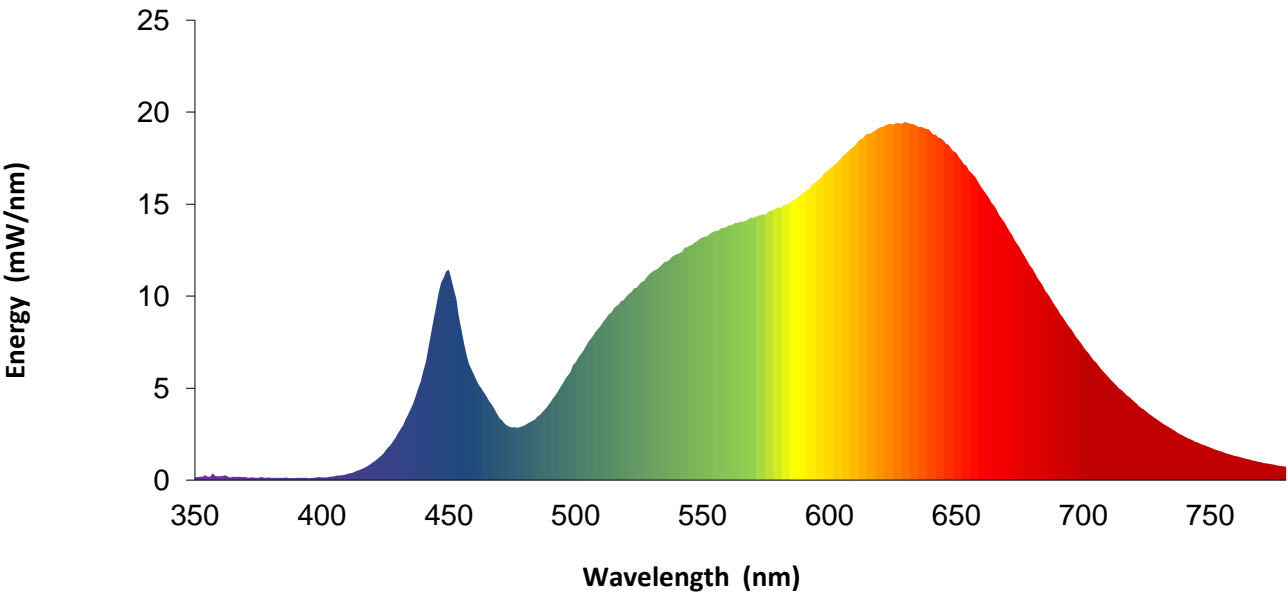
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0006	0.435	0.402	0.250	0.520



REPORT NO. 104659241CRT-016

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

REPORT NO. 104659241CRT-016

#	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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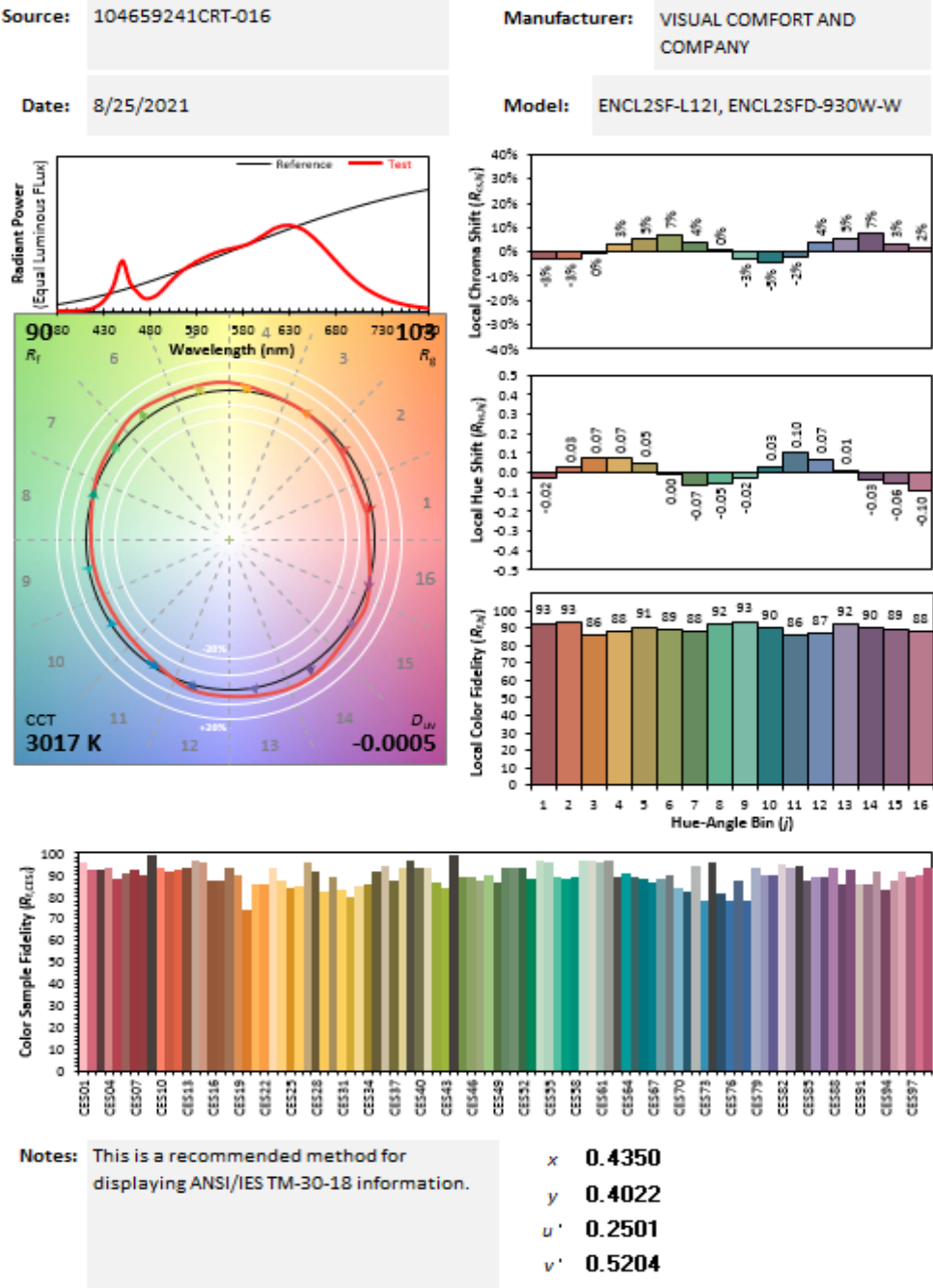
ANNEX A - TM-30 CALCULATIONS

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



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