

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ENCL2SF-L08I, ENCL2SFD-927W-W

## PROJECT NUMBER

G104659241

## REPORT NUMBER

104659241CRT-018

## 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-018

**MODEL NUMBER(s)**

ENCL2SF-L08I, ENCL2SFD-927W-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  
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Reviewer:



Jeff Davis  
Technical Lead  
Lighting Division

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**SAMPLE INFORMATION**

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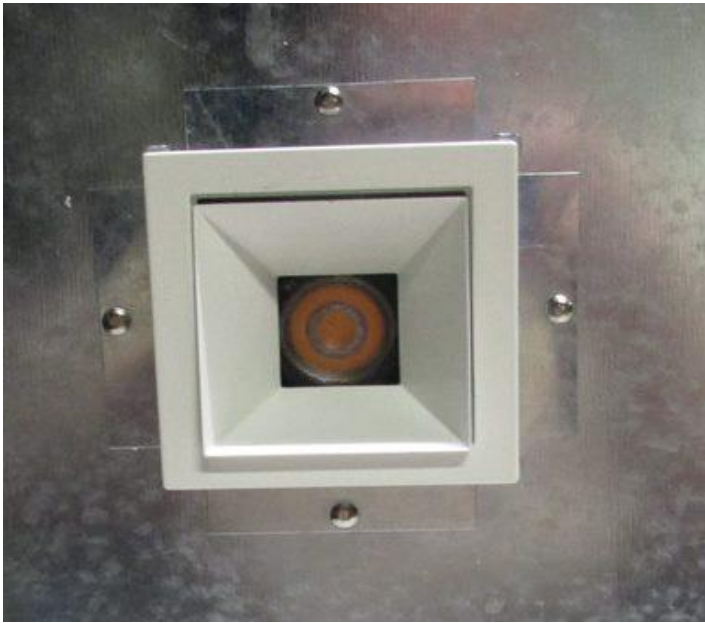
**ITEMS RECEIVED**

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	CRT2108131437-001-4	BXRE-27-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	CRT2108131437-001-17	--	40° Optic	Production	8/13/2021

**TESTED SAMPLE CONFIGURATIONS**

Config No.	Tested Model No.	Item Nos. Utilized
1	ENCL2SF-L08I, ENCL2SFD-927W-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-L08I, ENCL2SFD-927W-W
Product Description:	8 Watt, 40° Beam, 2700K, 0° Tilt
LED Model No.:	BXRE-27-G1000-C-83
Driver Model No.:	ESS010W-0200-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	564.1	557.3
Input Power (W) @ 120 (Vac)	7.36	7.38
Lumen Efficacy (lm/W)	76.6	75.5
Input Power Factor (I) @ 120 (Vac)	0.984	0.982

Criteria	Results
Input ATHD (%) @ 120 (Vac)	12.57
Correlated Color Temperature (K)	2710
Color Rendering Index - Ra (I)	92.2
Color Rendering Index - R9 (I)	69.4
Duv (I)	0.0013
Chromaticity Coordinate (x)	0.457
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.262
Chromaticity Coordinate (v')	0.526

## 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, ENCL2SFD-927W-W	NA

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

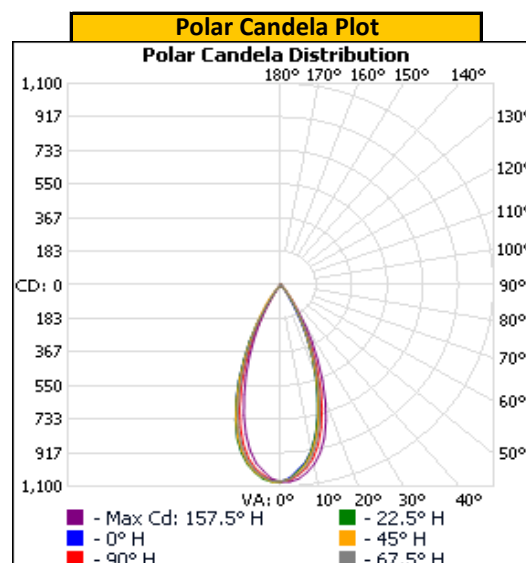
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.09	62.3	7.36	0.984

Light Output (lm)	Lumen Efficacy (lm/W)
564.1	76.6

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	1074	1074	1074	1074	1074
5	1014	1020	1030	1036	1042
10	917	916	926	941	961
15	741	738	756	780	807
20	528	525	540	566	599
25	326	328	339	358	379
30	141	169	188	192	179
35	55	67	96	75	69
40	18	24	37	27	24
45	6	6	16	7	7
50	1	2	4	2	2
55	0	0	1	0	0
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



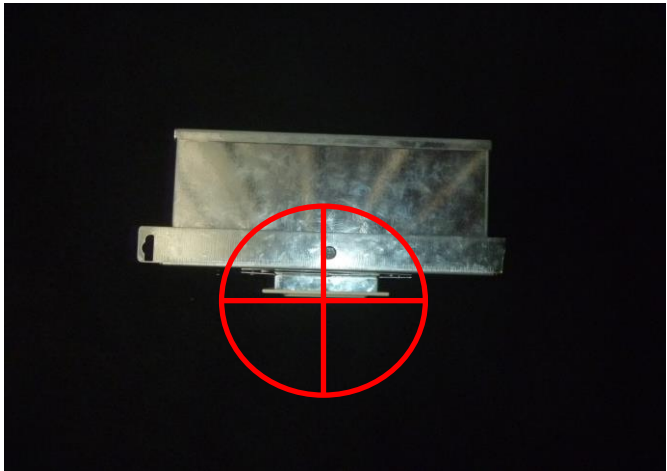
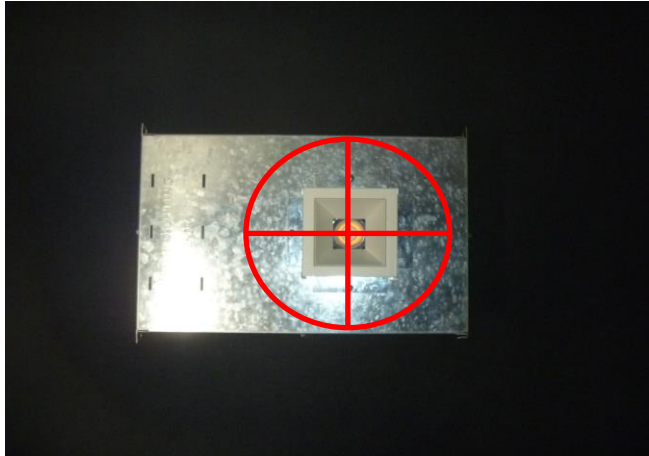
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ORIENTATION AND ALIGNMENT OF EUT

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

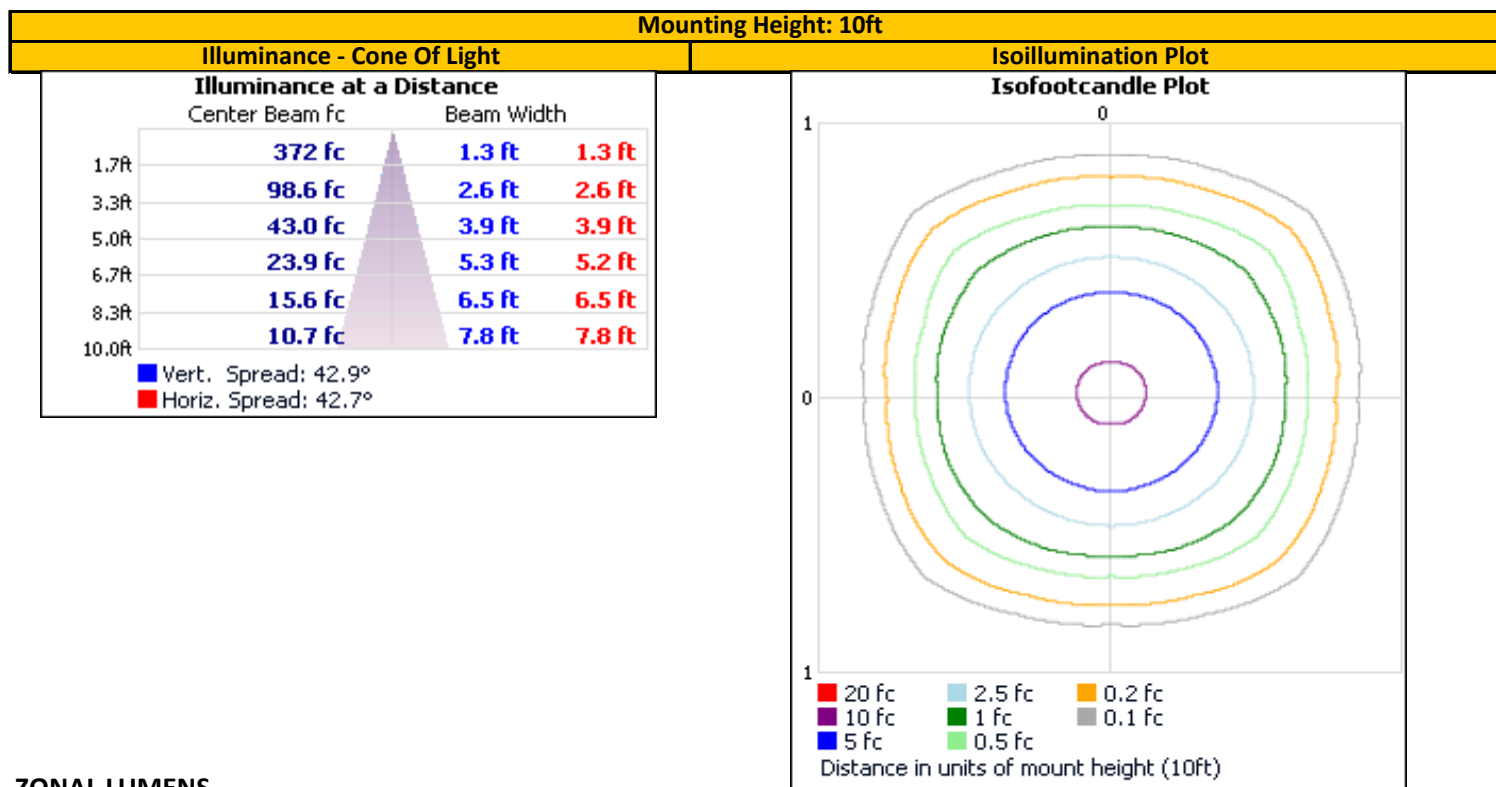
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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## ILLUMINANCE SUMMARY



## ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	492.3	87.3%	0-10	96.6	17.1%
0-40	553.2	98.1%	10-20	219.5	38.9%
0-60	564.1	100.0%	20-30	176.1	31.2%
60-90	0.0	0.0%	30-40	60.8	10.8%
70-100	0.0	0.0%	40-50	10.3	1.8%
90-120	0.0	0.0%	50-60	0.7	0.1%
0-90	564.1	100.0%	60-70	0.0	0.0%
90-180	0.0	0.0%	70-80	0.0	0.0%
0-180	564.1	100.0%	80-90	0.0	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**

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFD-927W-W	NA

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

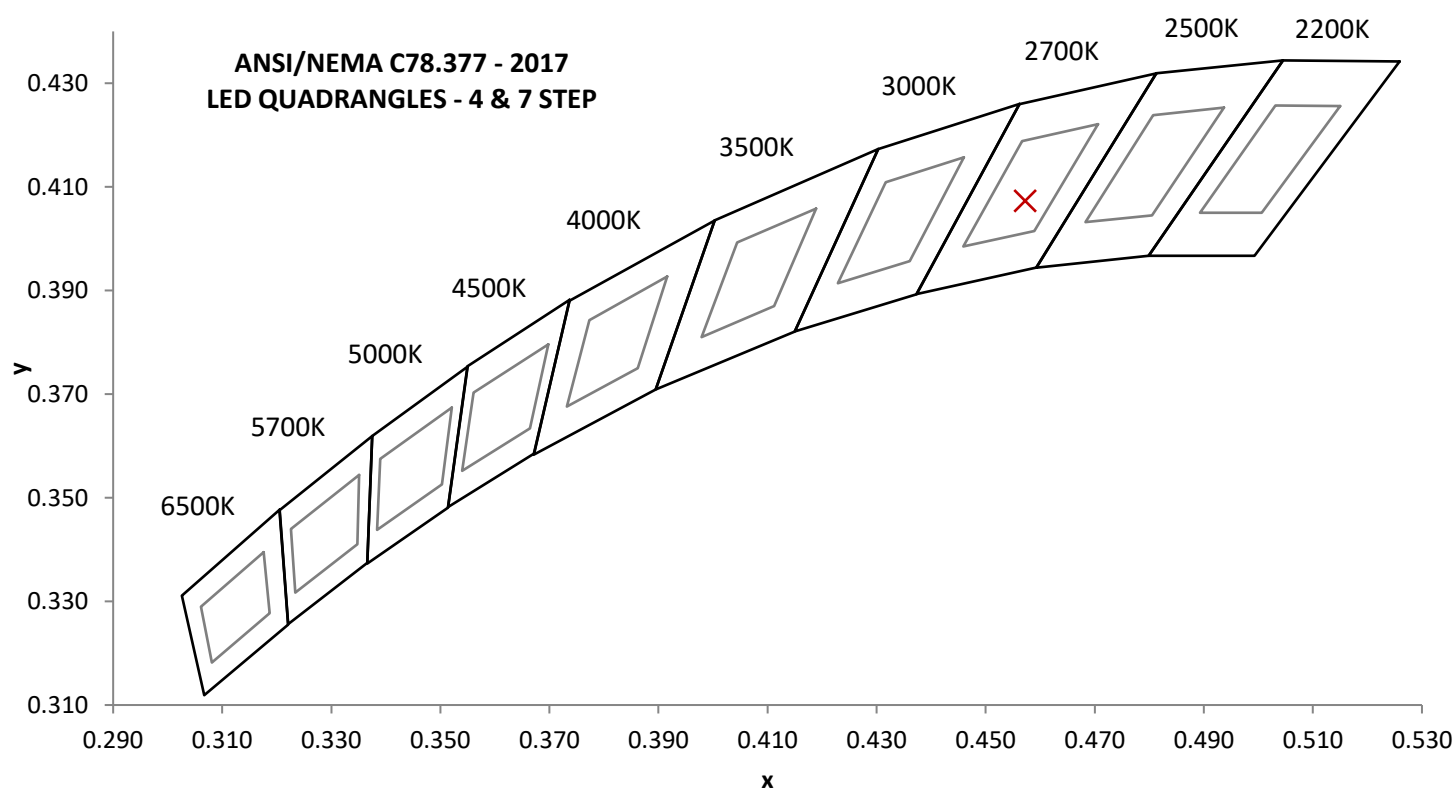
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.04	62.7	7.38	0.982	12.57

Measured at 120.04(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
557.3	75.5	2710	92.2	69.4

Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0013	0.457	0.407	0.262	0.526

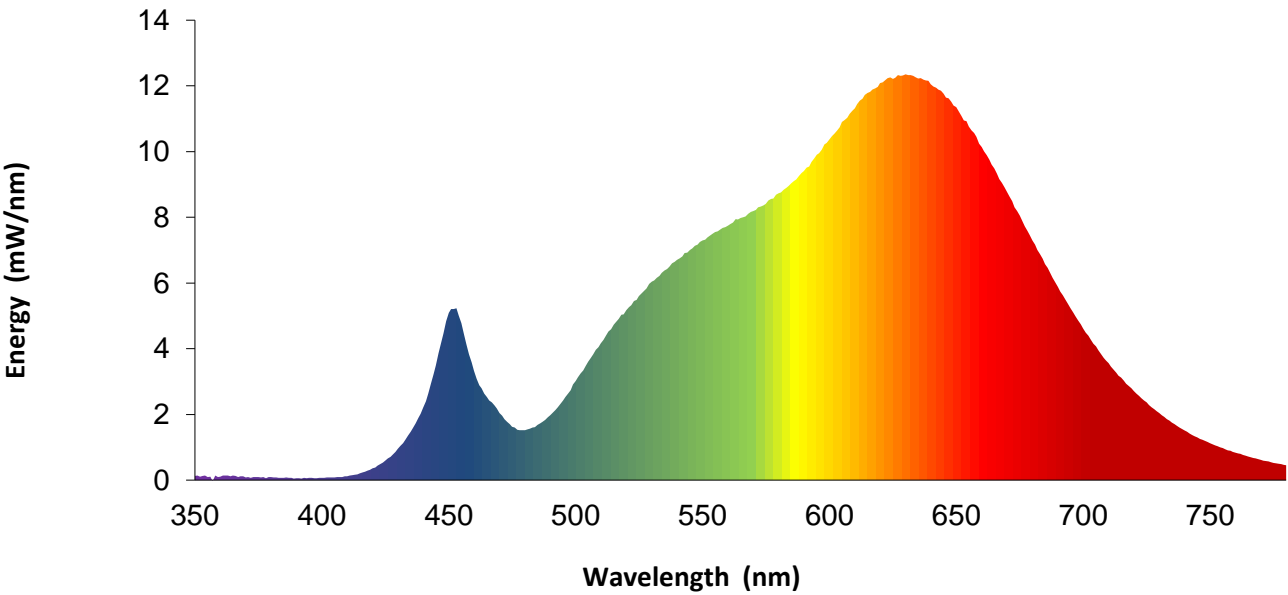




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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	3.3		570	8.2		680	7.3
355	0.1		465	2.5		575	8.4		685	6.6
360	0.1		470	2.0		580	8.7		690	5.9
365	0.1		475	1.6		585	9.0		695	5.2
370	0.1		480	1.5		590	9.4		700	4.6
375	0.1		485	1.7		595	9.9		705	4.1
380	0.1		490	2.0		600	10.4		710	3.6
385	0.1		495	2.4		605	10.9		715	3.1
390	0.1		500	3.0		610	11.3		720	2.7
395	0.1		505	3.6		615	11.8		725	2.4
400	0.1		510	4.2		620	12.1		730	2.0
405	0.1		515	4.7		625	12.2		735	1.8
410	0.1		520	5.2		630	12.4		740	1.5
415	0.2		525	5.6		635	12.2		745	1.3
420	0.4		530	6.0		640	12.1		750	1.1
425	0.6		535	6.4		645	11.8		755	1.0
430	1.0		540	6.7		650	11.4		760	0.8
435	1.5		545	7.0		655	10.8		765	0.7
440	2.2		550	7.3		660	10.1		770	0.6
445	3.5		555	7.6		665	9.5		775	0.5
450	5.1		560	7.7		670	8.8		780	0.5
455	4.8		565	8.0		675	8.0		---	---



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

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ENCL2SF-L08I, ENCL2SFD-927W-W	NA

TM-30 REPORT

ANSI/IES TM-30-18 Color Rendition Report

