

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

ESSF1212U4863930KWF1EF

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CHI-051

ISSUE DATE

6/28/2022

REVISED DATE

None

TEST DATES

2022-06-22 through 2022-06-27.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CHI-051

MODEL NUMBER(s)

ESSF1212U4863930KWF1EF

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 600186-0. 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-01236637-1.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI/IES LM-79-19 Optical and Electrical Measurements of Solid-State Lighting Products

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

IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

In Charge of Testing:



Nick Lau
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Reviewer:



Jeff Davis
N.A. Technical Lead
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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH06132022110621	ESSF1212U4863930KWF 1EF	U SERIES, 1212 CHANNEL, 800LM/FT 930 LOUVERS	Production	6/13/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	ESSF1212U4863930KWF1EF	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	ESSF1212U4863930KWF1EF
Product Description:	U SERIES, 1212 CHANNEL, 800LM/FT 930 LOUVERS
LED Model No.:	AA5594-02
Driver Model No.:	NA
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	971.0	1006.3
Input Power (W) @ 24 (Vdc)	28.40	28.23
Lumen Efficacy (lm/W)	34.2	35.7
Input Power Factor (I) @ 24 (Vdc)	NA	NA

Criteria	Results
Input ATHD (%) @ 24 (Vdc)	NA
Correlated Color Temperature (K)	2973
Color Rendering Index - Ra (I)	98.5
Color Rendering Index - R9 (I)	95.8
Duv (I)	0.0001
Chromaticity Coordinate (x)	0.439
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.522

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	ESSF1212U4863930KWF1EF	NA

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

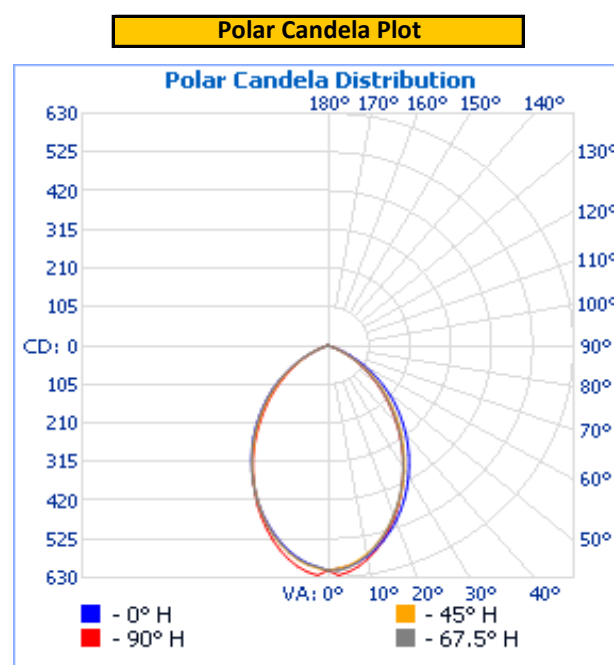
Base Orientation	Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	24.00	1183.4	28.40	NA

Light Output (lm)	Lumen Efficacy (lm/W)
971.0	34.2

INTENSITY SUMMARY - CANDELA

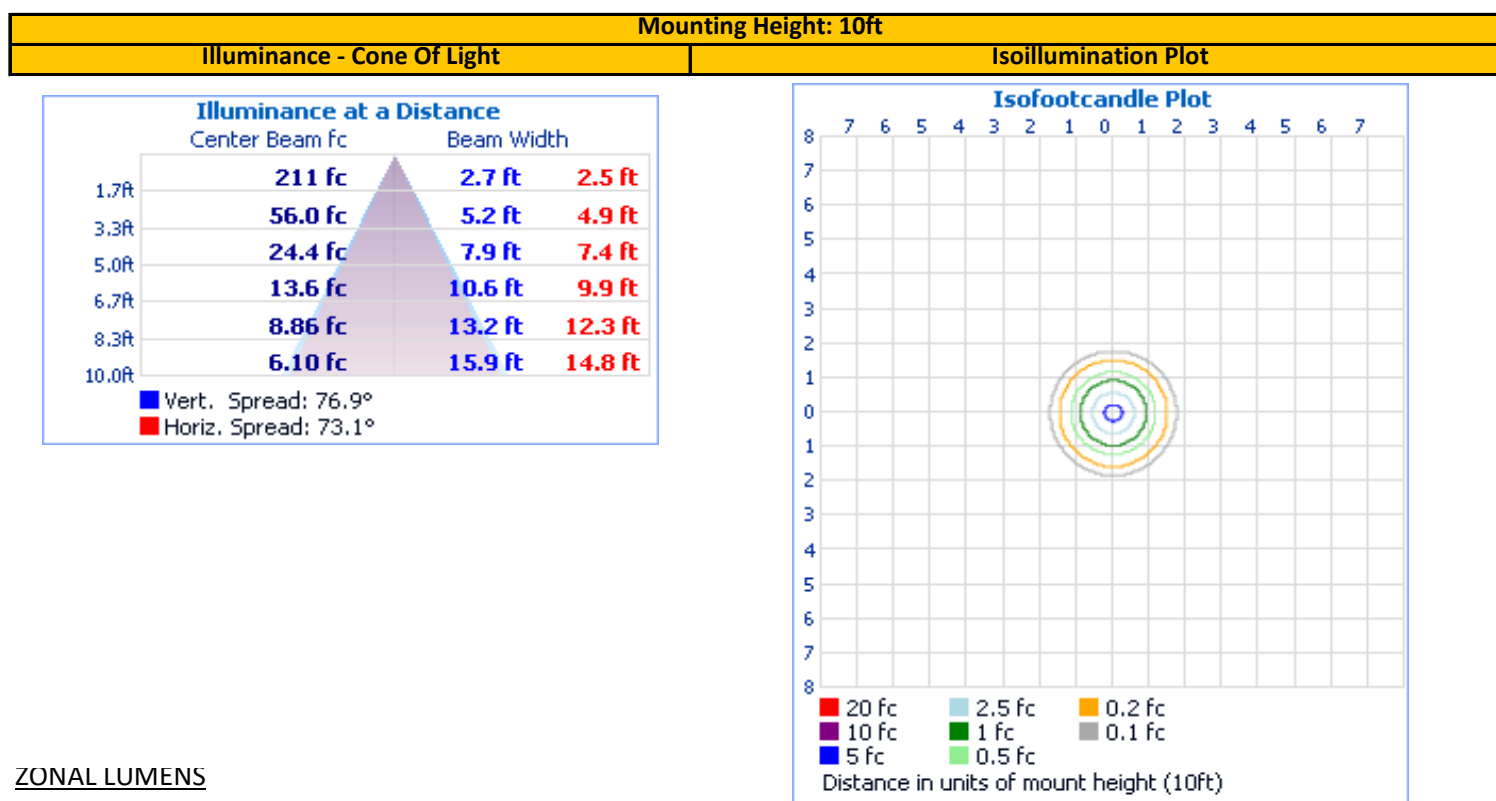
Angle	0	22.5	45	67.5	90
0	610.1	610.1	610.1	610.1	610.1
5	601	596.3	598.9	604.6	616
10	580.3	572.6	573.3	577.3	587.7
15	547.9	537.6	536.6	538.2	546.4
20	507.8	494.4	492.3	491.8	496.6
25	462.2	446.4	443.4	440	442.8
30	412.2	394.8	390.5	385.4	386.4
35	360.9	342.9	336.4	330.1	329.8
40	309.4	289.9	282.8	275.3	273.1
45	257.6	238.3	230.4	222.1	219.2
50	206.2	188.9	179.9	172.1	168.4
55	155.3	140.7	132.4	124.4	121.1
60	107.5	95.4	87.6	81.5	81
65	60.2	54.4	48.1	44.5	46
70	23.5	19.2	17.1	16.2	16.7
75	3.9	2.8	3.2	3.2	2.7
80	1.6	1.4	1.5	1.5	1.4
85	0.6	0.6	0.5	0.5	0.5
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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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	410.5	42.3%	0-10	56.5	5.8%
0-40	620.3	63.9%	10-20	150.8	15.5%
0-60	915.7	94.3%	20-30	203.2	20.9%
60-90	55.2	5.7%	30-40	209.8	21.6%
70-100	6.1	0.6%	40-50	177.3	18.3%
90-120	0.0	0.0%	50-60	118.1	12.2%
0-90	971.0	100.0%	60-70	49.1	5.1%
90-180	0.0	0.0%	70-80	5.5	0.6%
0-180	971.0	100.0%	80-90	0.6	0.1%
			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	ESSF1212U4863930KWF1EF	NA

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

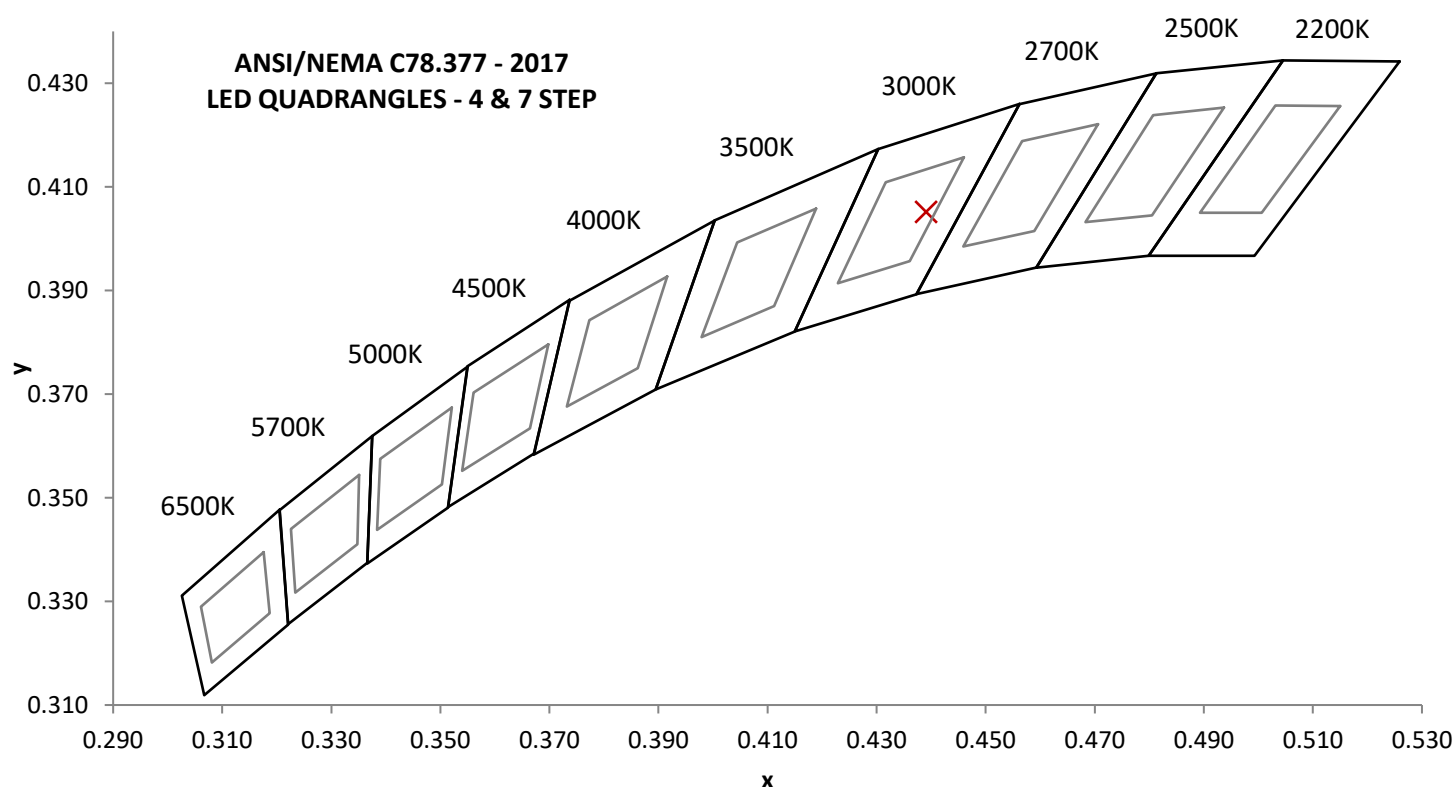
Base Orientation
Up

Input Voltage (Vdc)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
24.00	1176.1	28.23	NA	NA

Measured at 24(Vdc)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
1006.3	35.7	2973	98.5	95.8

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0001	0.439	0.405	0.251	0.522

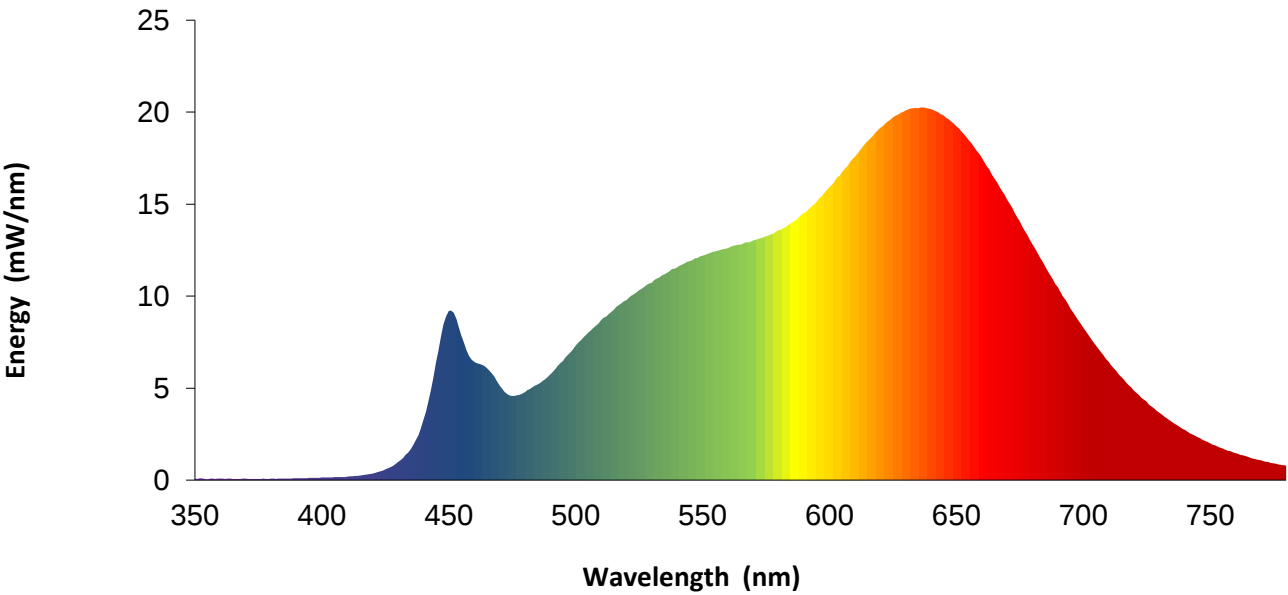


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	6.4		570	13.0		680	12.8
355	0.0		465	6.1		575	13.3		685	11.6
360	0.1		470	5.2		580	13.6		690	10.5
365	0.1		475	4.6		585	14.0		695	9.3
370	0.1		480	4.8		590	14.5		700	8.3
375	0.1		485	5.2		595	15.1		705	7.3
380	0.1		490	5.7		600	15.9		710	6.4
385	0.1		495	6.5		605	16.7		715	5.6
390	0.1		500	7.3		610	17.6		720	4.9
395	0.1		505	8.0		615	18.4		725	4.3
400	0.1		510	8.7		620	19.1		730	3.7
405	0.2		515	9.3		625	19.7		735	3.2
410	0.2		520	9.8		630	20.1		740	2.7
415	0.2		525	10.3		635	20.2		745	2.3
420	0.4		530	10.7		640	20.2		750	2.0
425	0.6		535	11.2		645	19.8		755	1.7
430	1.0		540	11.6		650	19.2		760	1.5
435	1.7		545	11.9		655	18.5		765	1.3
440	3.3		550	12.2		660	17.5		770	1.1
445	6.4		555	12.4		665	16.4		775	0.9
450	9.2		560	12.6		670	15.3		780	0.8
455	7.9		565	12.8		675	14.1		---	---

Without correction of sample absorption.



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	Yokogawa Power Meter	WT310E	CHI0664	3/30/2022	3/30/2023
2	Omega Thermometer	DPI8-C24	146920	10/4/2021	10/4/2022
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	CHI0452	2/3/2022	2/3/2023
5	Chroma Power Supply	61604	CHI0371	VBU	VBU
8	Newport Humidity Recorder	iServer	146961	9/21/2021	9/21/2022
9	Labsphere Spectroradiometer	CDS2600	CHI0539	VBU	VBU
10	3 Meter Sphere	SPR600	CHI0088	VBU	VBU
12	Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
13	Yokogawa Power Meter	WT1600	146769	4/5/2022	4/5/2023
17	Omega thermometer	USB TC08	EQAH002615	4/5/2022	4/5/2023

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

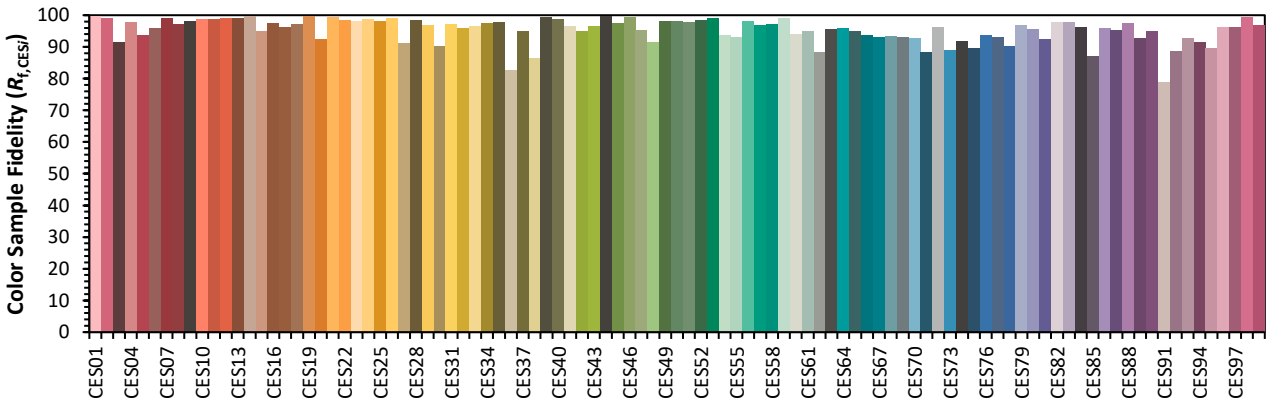
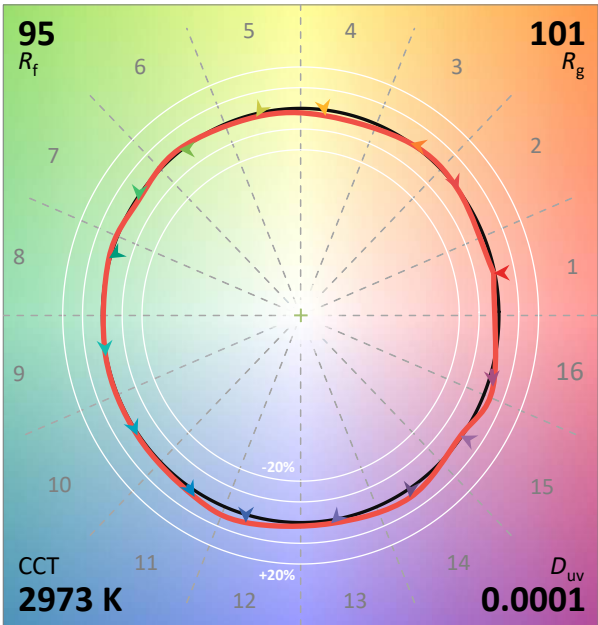
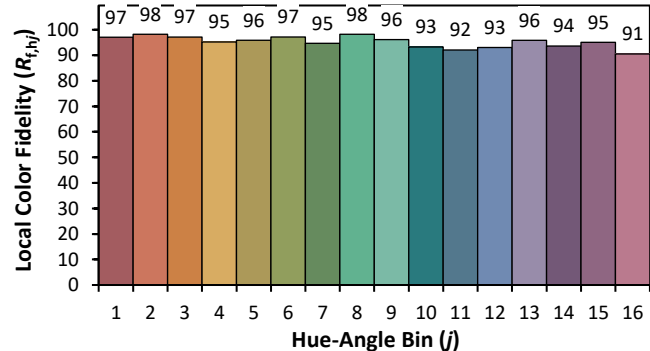
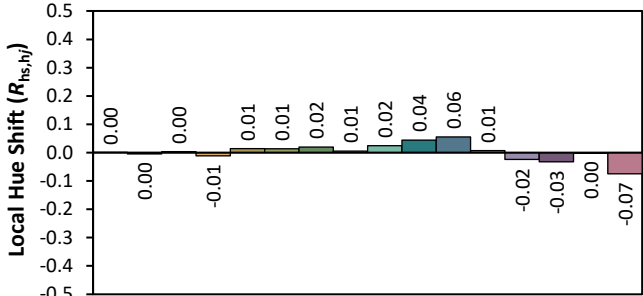
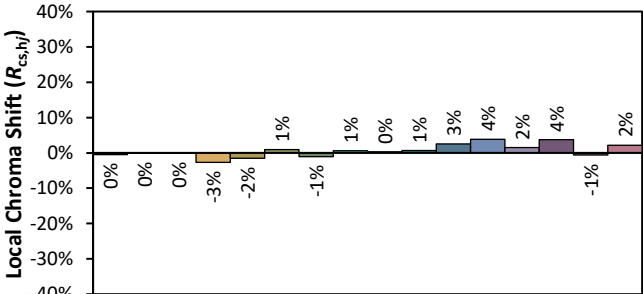
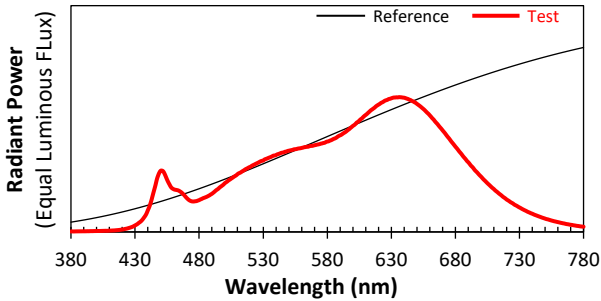
#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	ESSF1212U4863930KWF1EF	NA

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD
Date: 6/22/2022

Manufacturer: VISUAL COMFORT AND COMPANY
Model: ESSF1212U4863930KWF1EF



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

x 0.4391
y 0.4051
u' 0.2515
v' 0.5221