

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

EC3RF-24930W-UNV-W

## PROJECT NUMBER

G105578967

## REPORT NUMBER

105578967CHI-001

## ISSUE DATE

9/21/2023

## REVISED DATE

None

## TEST DATES

2023-09-14 through 2023-09-15.

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

105578967CHI-001

**MODEL NUMBER(s)**

EC3RF-24930W-UNV-W

**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-01387083-0.

**TEST STANDARDS**

IES 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

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

In Charge of Testing:



David Dalo  
Engineer  
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Reviewer:



Jeff Davis  
NA Technical Lead  
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**SAMPLE INFORMATION**

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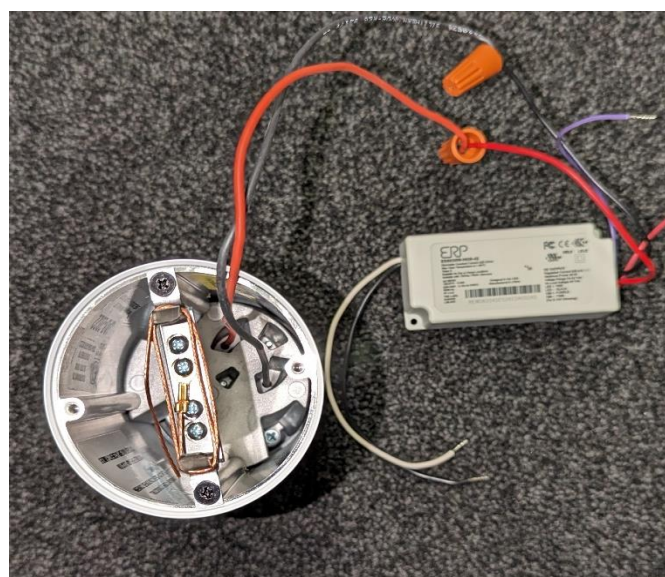
**ITEMS RECEIVED**

Item No.	Control No.	Model No.	Description	Type	Received
1	AH09132023015610	EC3RF-24930W-UNV-W	Entra Cylinder WW 24W	Production	9/13/2023

**TESTED SAMPLE CONFIGURATIONS**

Config No.	Tested Model No.	Item Nos. Utilized
1	EC3RF-24930W-UNV-W	1

**SAMPLE PHOTOS - TESTED CONFIGURATIONS**



## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	EC3RF-24930W-UNV-W
Product Description:	Entra Cylinder WW 24W
LED Model No.:	AA5032
Driver Model No.:	N/A
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1334.8	1348.0
Input Power (W) @ 120 (Vac)	23.83	23.81
Lumen Efficacy (lm/W)	56.0	56.6
Input Power Factor (I) @ 120 (Vac)	0.984	0.985

Criteria	Results
Input ATHD (%) @ 120 (Vac)	16.20
Correlated Color Temperature (K)	3050
Color Rendering Index - Ra (I)	90.7
Color Rendering Index - R9 (I)	64.0
Duv (I)	-0.0005
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.401
Chromaticity Coordinate (u')	0.249
Chromaticity Coordinate (v')	0.520
Input Power (W) @ 277 (Vac)	24.16
Input Power Factor (I) @ 277 (Vac)	0.943
Input ATHD (%) @ 277 (Vac)	12.50

## 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.

\*ANSI/IES Technical Memorandums (TM) reported are not NVLAP accredited

**TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING**

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RF-24930W-UNV-W	NA

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

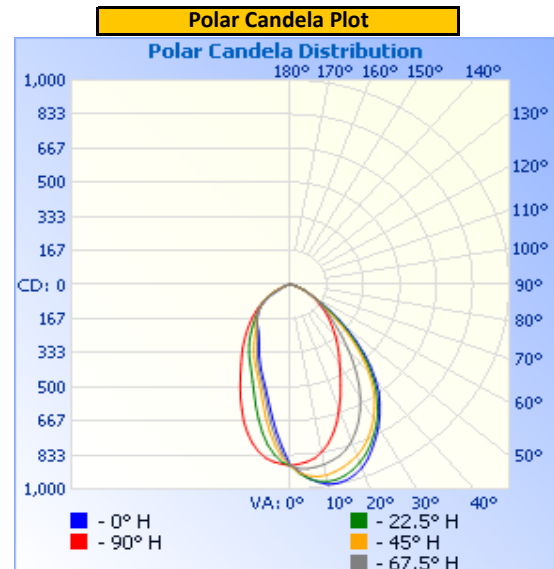
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.05	201.7	23.83	0.984

Light Output (lm)	Lumen Efficacy (lm/W)
1334.8	56.0

**INTENSITY SUMMARY - CANDELA**

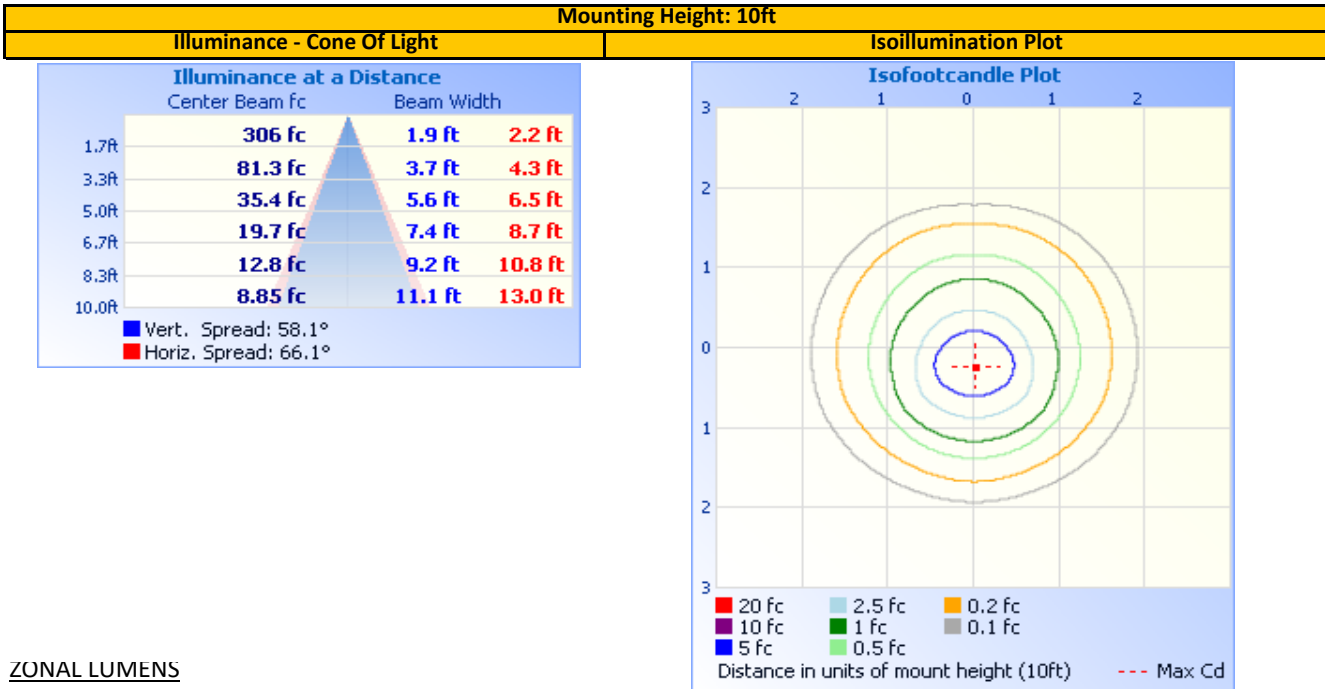
Angle	0	22.5	45	67.5	90
0	885	885	885	885	885
5	951	952	939	903	870
10	992	978	947	893	831
15	991	966	925	867	753
20	955	926	890	816	649
25	884	865	835	737	542
30	804	788	760	639	450
35	712	693	670	525	380
40	604	583	555	409	316
45	476	454	425	306	259
50	341	324	290	230	208
55	224	208	185	175	161
60	129	123	125	127	118
65	82	79	83	83	77
70	51	49	48	46	42
75	27	24	23	21	20
80	9	9	10	11	12
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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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	560.4	42.0%	90-100	0.0	0.0%
0-40	842.4	63.1%	100-110	0.0	0.0%
0-60	1,231.9	92.3%	110-120	0.0	0.0%
60-90	103.0	7.7%	120-130	0.0	0.0%
70-100	28.4	2.1%	130-140	0.0	0.0%
90-120	0.0	0.0%	140-150	0.0	0.0%
0-90	1,334.8	100.0%	150-160	0.0	0.0%
90-180	0.0	0.0%	160-170	0.0	0.0%
0-180	1,334.8	100.0%	170-180	0.0	0.0%

**INTEGRATING SPHERE TESTING**

**REPORT NO. 105578967CHI-001**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RF-24930W-UNV-W	NA

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

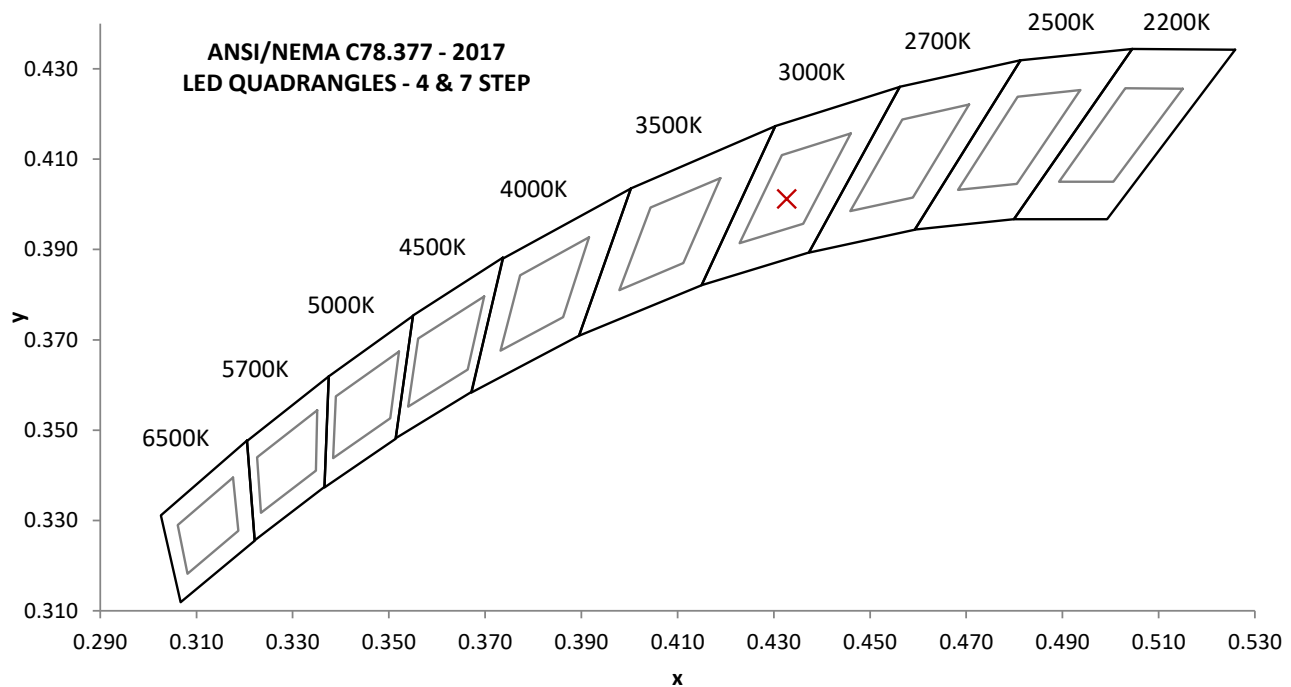
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.02	201.5	23.81	0.985	16.20
277.02	92.0	24.16	0.943	12.50

Measured at 120.02(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
1348.0	56.6	3050	90.7	64.0

Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0005	0.433	0.401	0.249	0.520



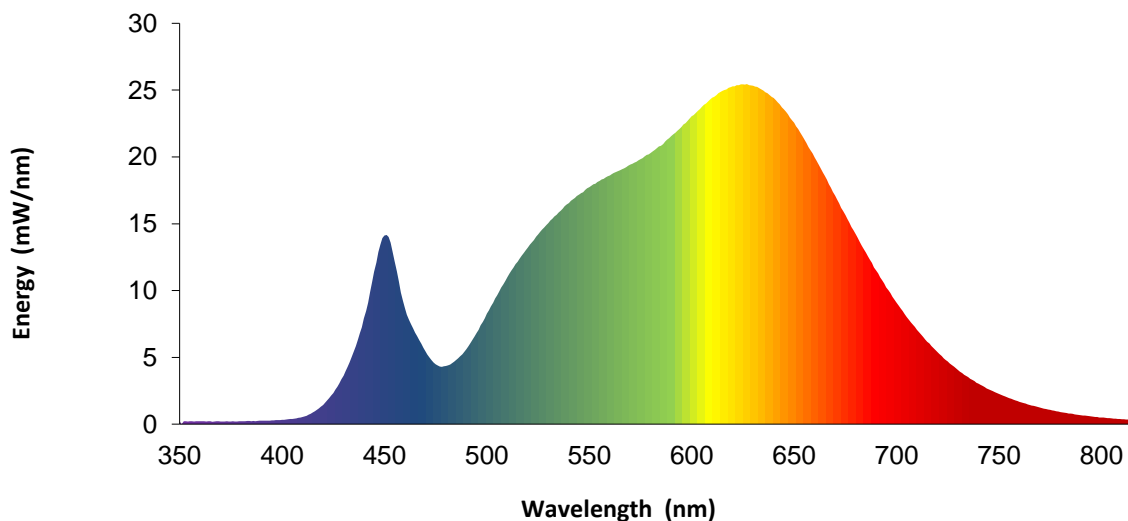


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	8.7		570	19.4		680	14.2
355	0.2		465	6.9		575	19.8		685	12.8
360	0.2		470	5.5		580	20.3		690	11.5
365	0.2		475	4.5		585	20.8		695	10.2
370	0.2		480	4.4		590	21.6		700	9.1
375	0.2		485	4.8		595	22.2		705	8.0
380	0.2		490	5.6		600	23.0		710	7.1
385	0.2		495	6.8		605	23.7		715	6.2
390	0.3		500	8.3		610	24.4		720	5.4
395	0.3		505	9.6		615	25.0		725	4.7
400	0.3		510	11.0		620	25.3		730	4.0
405	0.4		515	12.2		625	25.4		735	3.5
410	0.5		520	13.2		630	25.3		740	3.0
415	0.9		525	14.2		635	25.0		745	2.6
420	1.4		530	15.1		640	24.4		750	2.3
425	2.3		535	15.8		645	23.6		755	2.0
430	3.6		540	16.5		650	22.6		760	1.7
435	5.4		545	17.2		655	21.3		765	1.4
440	7.9		550	17.7		660	20.0		770	1.2
445	11.4		555	18.2		665	18.6		775	1.1
450	14.1		560	18.6		670	17.1		780	0.9
455	12.2		565	19.0		675	15.7		---	---

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	4/3/2023	4/3/2024
2	Omega Thermometer	DPI8-C24	146920	10/4/2022	10/4/2023
3	LSI High Speed Mirror Goniometer	6440T	146928	VBV	VBV
4	Omega Thermohygrometer	OM-CP-RFPRHTEMP2000A	CHI0780	4/3/2023	4/3/2024
5	Chroma Power Supply	61604	CHI0371	VBV	VBV
8	Omega Thermohygrometer	OM-CP-RFPRHTEMP2000A	CHI0778	4/3/2023	4/3/2024
9	Labsphere Spectroradiometer	CDS2600	CHI0539	VBV	VBV
10	3 Meter Sphere	SPR600	CHI0088	VBV	VBV
11	Elgar AC Power Supply	CW1251	146112	VBV	VBV
12	Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV
13	Yokogawa Power Meter	WT1600	146769	4/4/2023	4/4/2024
17	Omega thermometer	USB TC08	EQAH002615	4/4/2023	4/4/2024
26	Xitron Power Analyzer	2801	CHI0763	4/5/2023	4/5/2024

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	EC3RF-24930W-UNV-W	NA

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

Source: User SPD

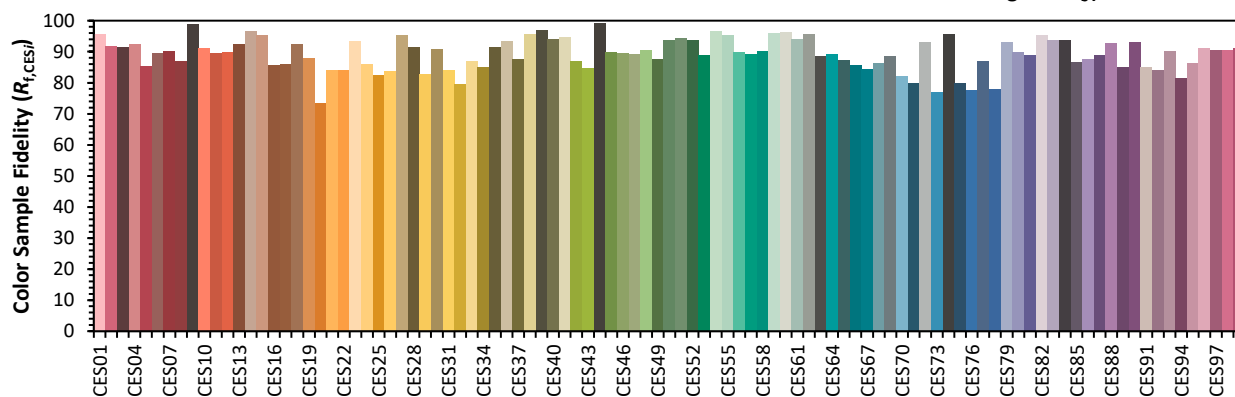
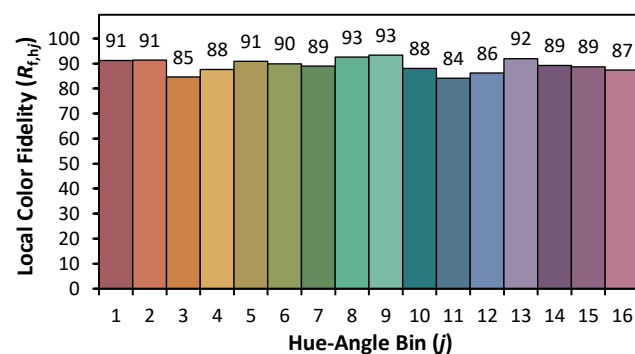
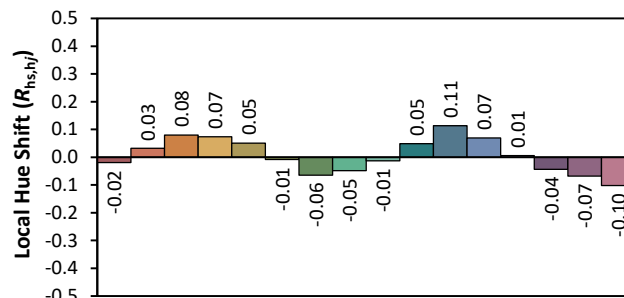
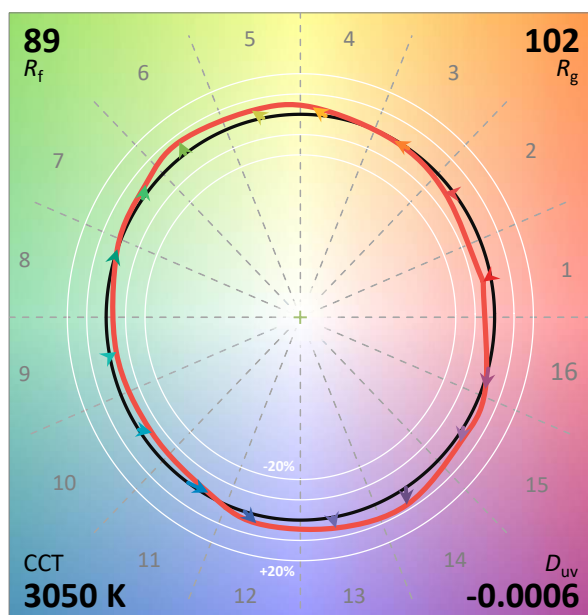
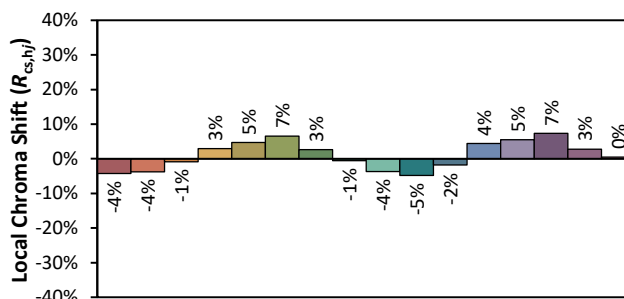
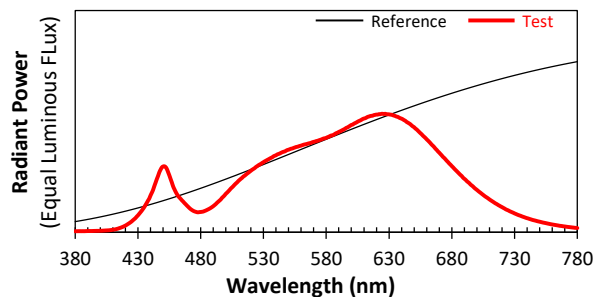
Manufacturer:

VISUAL COMFORT AND COMPANY

Date: 9/15/2023

Model:

EC3RF-24930W-UNV-W



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

x 0.4327

y 0.4012

u' 0.2491

v' 0.5196