

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

EC2RS-159WD314DN-UNV-W

## PROJECT NUMBER

G104941221

## REPORT NUMBER

104941221CHI-081

## ISSUE DATE

9/9/2022

## REVISED DATE

None

## TEST DATES

2022-09-13.

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

104941221CHI-081

**MODEL NUMBER(s)**

EC2RS-159WD314DN-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-01236637-1.

**TEST STANDARDS**

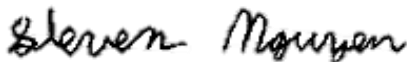
IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

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:



Steven Nguyen  
Engineer  
Lighting Division

Reviewer:



Jeff Davis  
N.A. Technical Lead  
Lighting Division

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## SAMPLE INFORMATION

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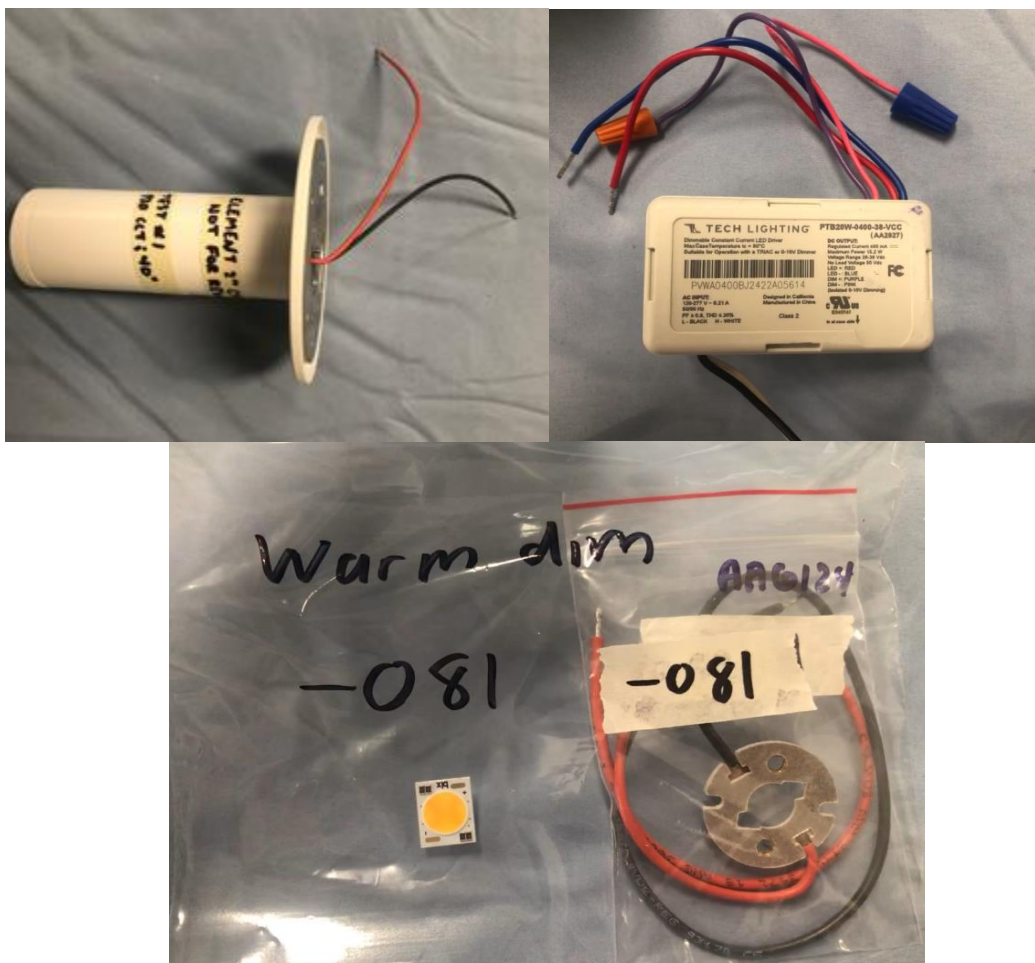
## ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH08252022081536	EEC2RS-159WD314DN-UNV-W	2" DOWNLIGHT LUMINAIRE	Production	8/25/2022

## TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
9	EC2RS-159WD314DN-UNV-W	1

## SAMPLE PHOTOS - TESTED CONFIGURATIONS



## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	EC2RS-159WD314DN-UNV-W
Product Description:	2" DOWNLIGHT LUMINAIRE
LED Model No.:	Bridgelux / BXR-V-DR-1830G-100V-B-22
Driver Model No.:	ERP / PTB20W-0400-38-VCC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	886.3	859.9
Input Power (W) @ 120VAC (Vac)	18.19	18.16
Lumen Efficacy (lm/W)	48.7	47.3
Input Power Factor (PF) @ 120VAC (Vac)	0.987	0.988

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	13.88
Correlated Color Temperature (K)	2989
Color Rendering Index - Ra (I)	93.8
Color Rendering Index - R9 (I)	75.4
Duv (I)	-0.0021
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.398
Chromaticity Coordinate (u')	0.252
Chromaticity Coordinate (v')	0.519

## 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
9	EC2RS-159WD314DN-UNV-W	NA

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

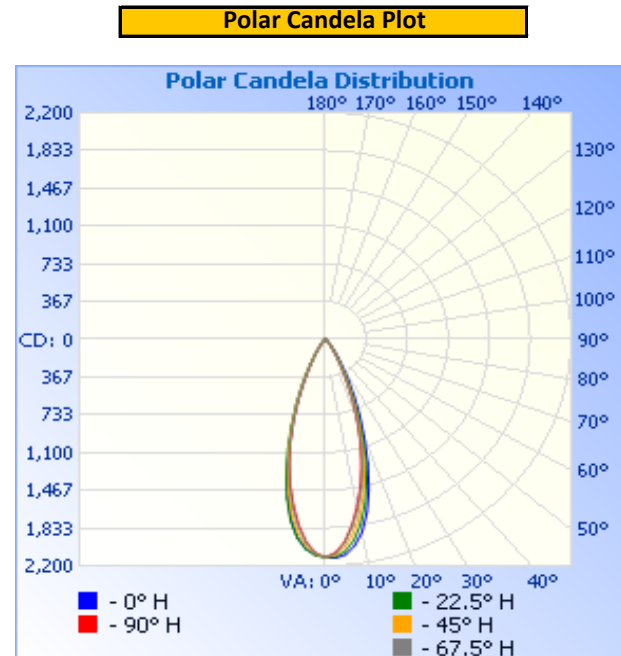
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.09	153.4	18.19	0.987

Light Output (lm)	Lumen Efficacy (lm/W)
886.3	48.7

**INTENSITY SUMMARY - CANDELA**

Angle	0	22.5	45	67.5	90
0	2117	2117	2117	2117	2117
5	2097	2063	2022	1984	1972
10	1896	1821	1745	1670	1643
15	1504	1420	1349	1280	1249
20	1020	951	895	842	828
25	613	549	503	464	449
30	319	271	239	217	212
35	155	130	110	100	96
40	74	62	54	50	50
45	36	31	27	25	25
50	17	15	14	14	14
55	8	8	8	8	7
60	5	5	5	5	5
65	4	4	3	3	3
70	1	1	1	1	1
75	1	1	1	1	1
80	1	0	0	1	1
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

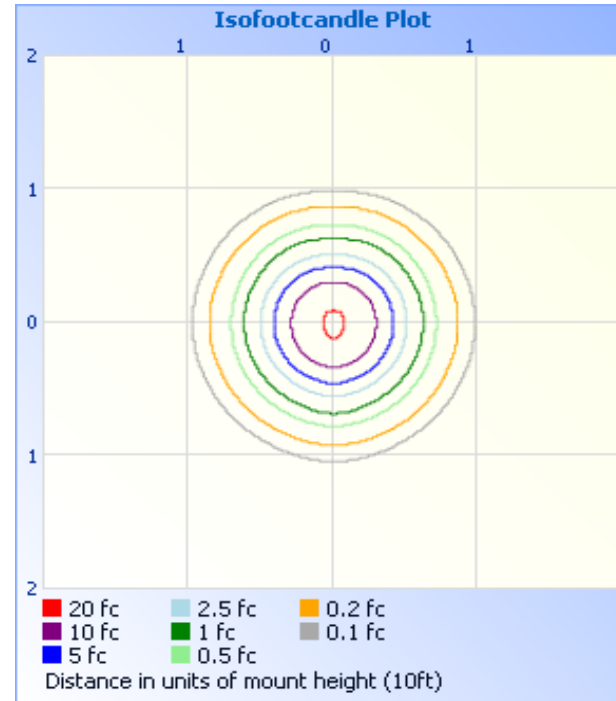
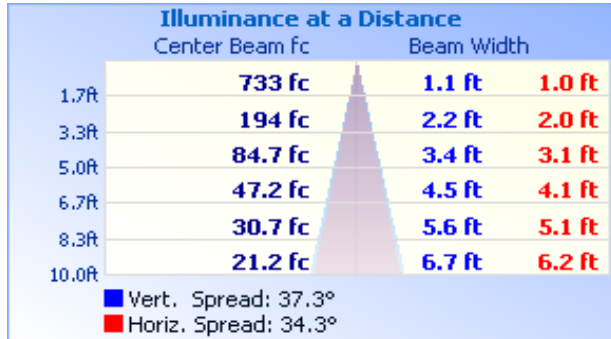
Entire luminous intensity matrix found in .IES file



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ILLUMINANCE SUMMARY

Mounting Height: 10ft	
Illuminance - Cone Of Light	Isoillumination Plot



ZONAL LUMENS

**Zonal Lumen Summary**

Zone	Lumens	Luminaire
0-30	775.2	87.5%
0-40	852.0	96.1%
0-60	882.2	99.5%
60-90	4.1	0.5%
70-100	1.1	0.1%
90-120	0.0	0.0%
0-90	886.3	100.0%
90-180	0.0	0.0%
0-180	886.3	100.0%

Zone	Lumens	Total	Zone	Lumens	Total
0-10	183.1	20.7%	90-100	0.0	0.0%
10-20	360.8	40.7%	100-110	0.0	0.0%
20-30	231.4	26.1%	110-120	0.0	0.0%
30-40	76.7	8.7%	120-130	0.0	0.0%
40-50	22.9	2.6%	130-140	0.0	0.0%
50-60	7.3	0.8%	140-150	0.0	0.0%
60-70	3.0	0.3%	150-160	0.0	0.0%
70-80	0.9	0.1%	160-170	0.0	0.0%
80-90	0.2	0.0%	170-180	0.0	0.0%

**INTEGRATING SPHERE TESTING**

**REPORT NO. 104941221CHI-081**

Test Configuration	Tested Model No.	Pass/Fail/NA
9	EEC2RS-159WD314DN-UNV-W	NA

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

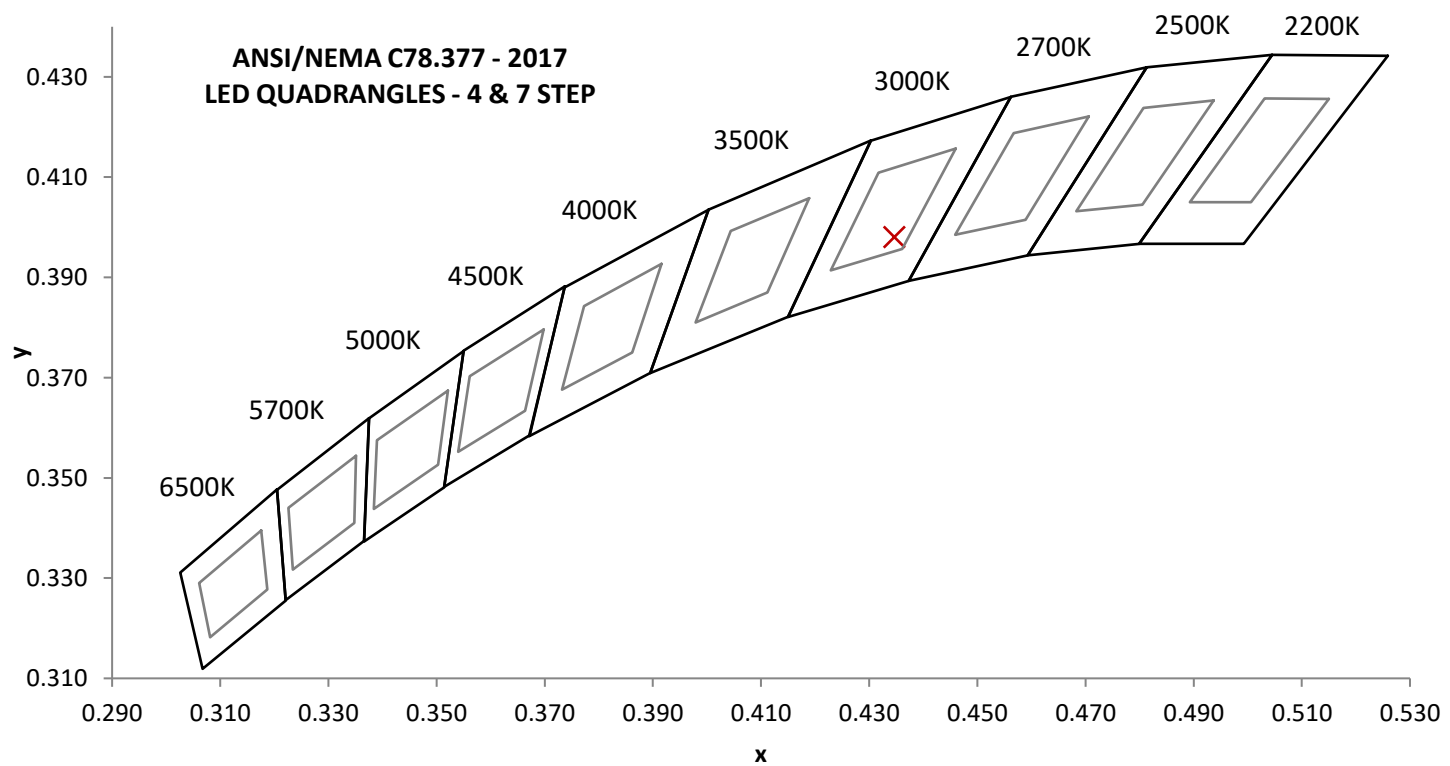
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
119.99	153.2	18.16	0.988	13.88

Measured at 119.99(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
859.9	47.3	2989	93.8	75.4

Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0021	0.435	0.398	0.252	0.519

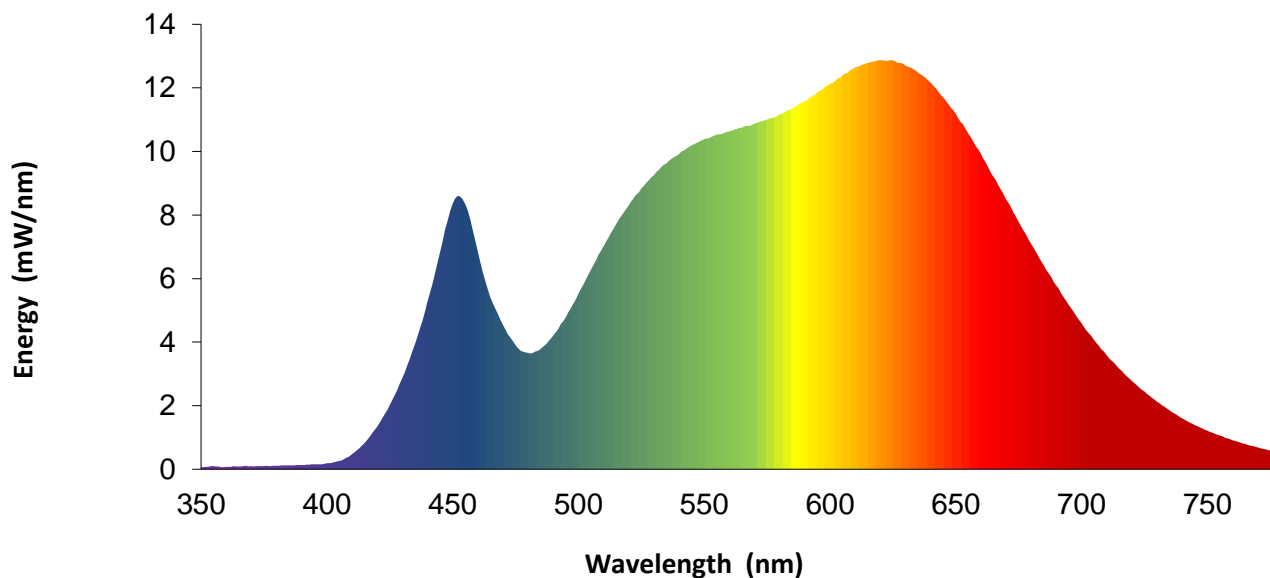


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	6.9		570	10.9		680	7.1
355	0.1		465	5.4		575	11.0		685	6.4
360	0.1		470	4.5		580	11.2		690	5.8
365	0.1		475	3.9		585	11.3		695	5.2
370	0.1		480	3.7		590	11.6		700	4.6
375	0.1		485	3.8		595	11.9		705	4.1
380	0.1		490	4.2		600	12.1		710	3.6
385	0.1		495	4.8		605	12.4		715	3.2
390	0.1		500	5.5		610	12.6		720	2.8
395	0.2		505	6.3		615	12.8		725	2.4
400	0.2		510	7.0		620	12.9		730	2.1
405	0.3		515	7.7		625	12.9		735	1.9
410	0.5		520	8.3		630	12.7		740	1.6
415	0.8		525	8.8		635	12.5		745	1.4
420	1.3		530	9.3		640	12.2		750	1.2
425	2.0		535	9.6		645	11.7		755	1.1
430	2.9		540	9.9		650	11.2		760	0.9
435	3.9		545	10.2		655	10.6		765	0.8
440	5.3		550	10.4		660	9.9		770	0.7
445	6.8		555	10.5		665	9.2		775	0.6
450	8.4		560	10.6		670	8.5		780	0.5
455	8.3		565	10.7		675	7.8		---	---

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
11	Elgar AC Power Supply	CW1251	146112	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
26	Xitron Power Analyzer	XT-2640	CHI0611	7/6/2022	7/6/2023

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
9	EC2RS-159WD314DN-UNV-W	NA

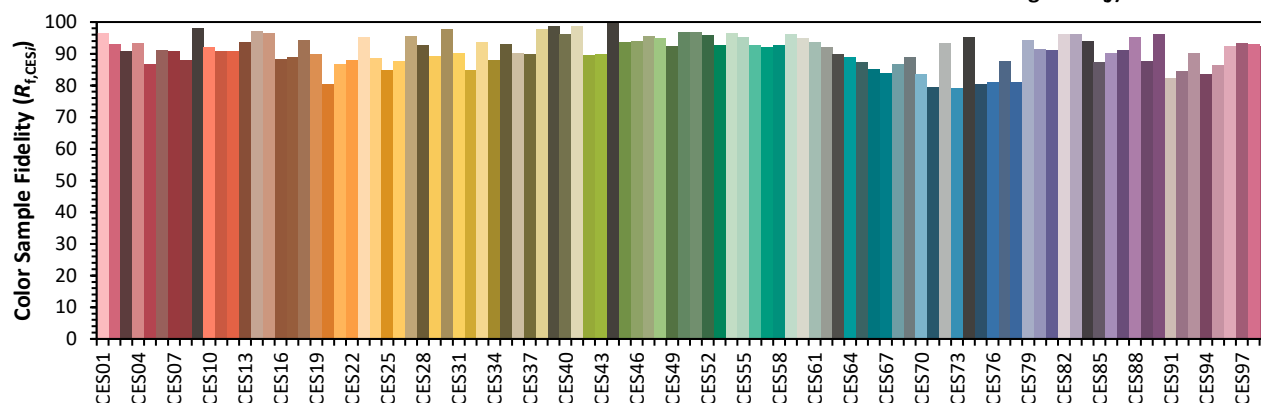
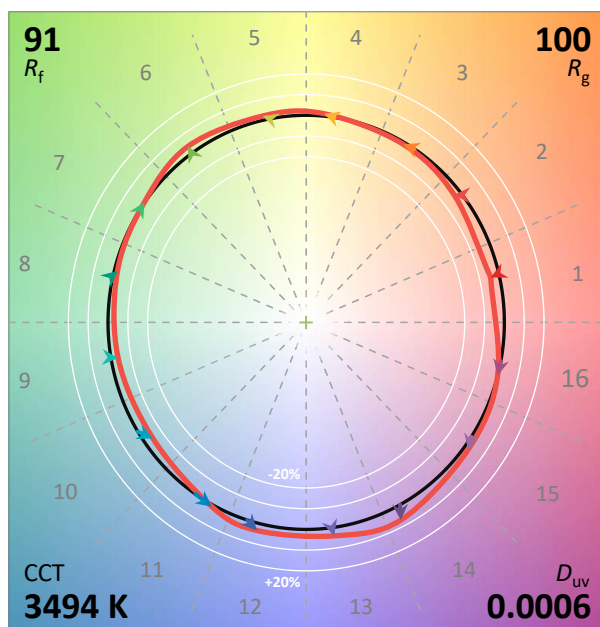
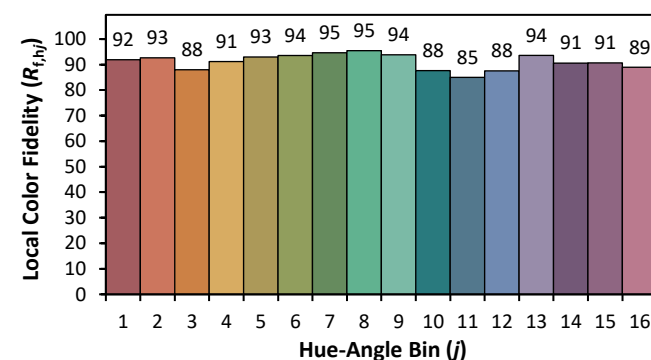
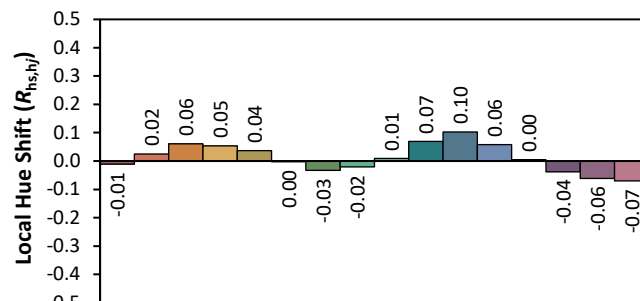
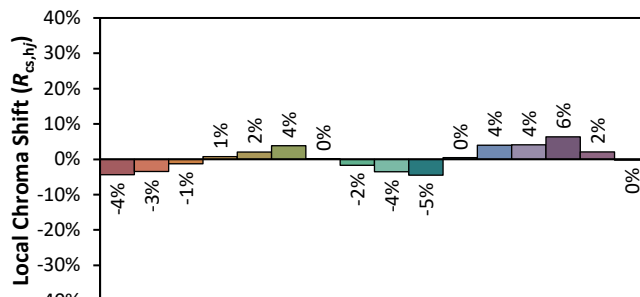
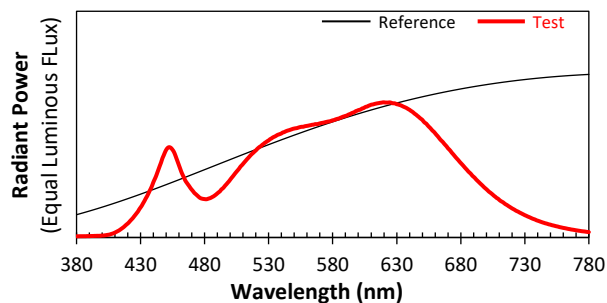
## ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 9/13/2022

Model: EC2RS-159WD314DN-UNV-W



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

x 0.4063

y 0.3926

u' 0.2356

v' 0.5122