

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

EC2RS-159303DN-UNV-W

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CHI-077

ISSUE DATE

9/9/2022

REVISED DATE

None

TEST DATES

2022-09-01 through 2022-09-08.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CHI-077

MODEL NUMBER(s)

EC2RS-159303DN-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

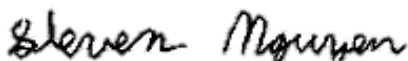
IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

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

REPORT NO. 104941221CHI-077

ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH08252022081536	EC2RS-159303DN-UNV-W	2" DOWNLIGHT LUMINAIRE	Production	8/25/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	EC2RS-159303DN-UNV-W	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	EC2RS-159303DN-UNV-W
Product Description:	2" DOWNLIGHT LUMINAIRE
LED Model No.:	Bridgelux / BXRE-30G1000-C-81
Driver Model No.:	ERP / PTB20W-0400-38-VCC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	948.8	943.6
Input Power (W) @ 120VAC (Vac)	14.91	14.82
Lumen Efficacy (lm/W)	63.6	63.7
Input Power Factor () @ 120VAC (Vac)	0.984	0.000

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	15.27
Correlated Color Temperature (K)	2998
Color Rendering Index - Ra ()	92.6
Color Rendering Index - R9 ()	73.3
Duv ()	-0.0022
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.398
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.518

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	EC2RS-159303DN-UNV-W	NA

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

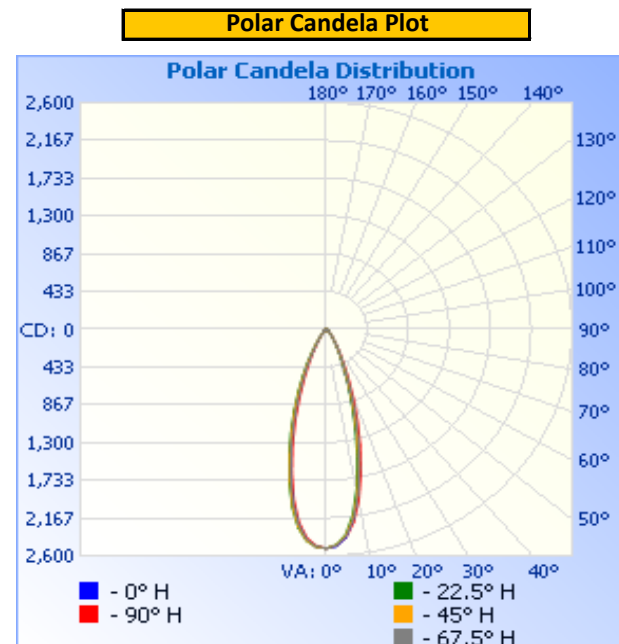
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)
Up	120.00	126.3	14.91	0.984

Light Output (lm)	Lumen Efficacy (lm/W)
948.8	63.6

INTENSITY SUMMARY - CANDELA

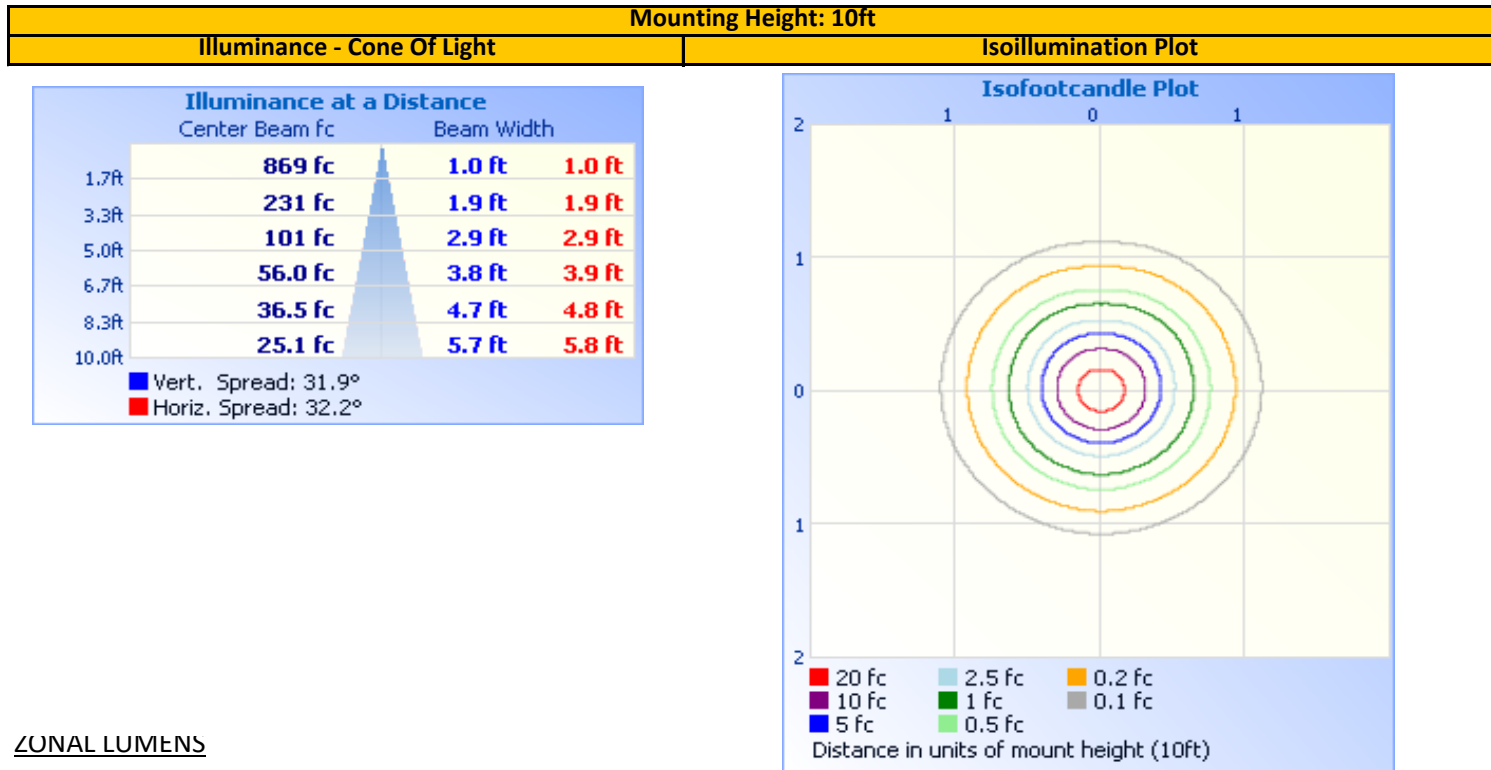
Angle	0	22.5	45	67.5	90
0	2513	2513	2513	2513	2513
5	2396	2360	2371	2386	2397
10	1899	1852	1896	1935	1982
15	1236	1191	1241	1314	1382
20	686	671	713	765	826
25	370	360	382	410	444
30	203	194	202	215	231
35	108	105	111	115	121
40	61	59	62	66	70
45	35	35	36	38	41
50	26	26	26	28	29
55	17	16	16	17	17
60	10	10	10	10	11
65	8	7	7	8	8
70	3	3	3	3	3
75	2	2	2	2	2
80	1	1	1	1	1
85	1	1	1	1	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	806.0	85.0%	0-10	214.6	22.6%
0-40	890.0	93.8%	10-20	373.3	39.3%
0-60	939.2	99.0%	20-30	218.2	23.0%
60-90	9.6	1.0%	30-40	83.9	8.8%
70-100	2.4	0.3%	40-50	33.5	3.5%
90-120	0.0	0.0%	50-60	15.7	1.7%
0-90	948.8	100.0%	60-70	7.2	0.8%
90-180	0.0	0.0%	70-80	1.9	0.2%
0-180	948.8	100.0%	80-90	0.5	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

REPORT NO. 104941221CHI-077

Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC2RS-159303DN-UNV-W	NA

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

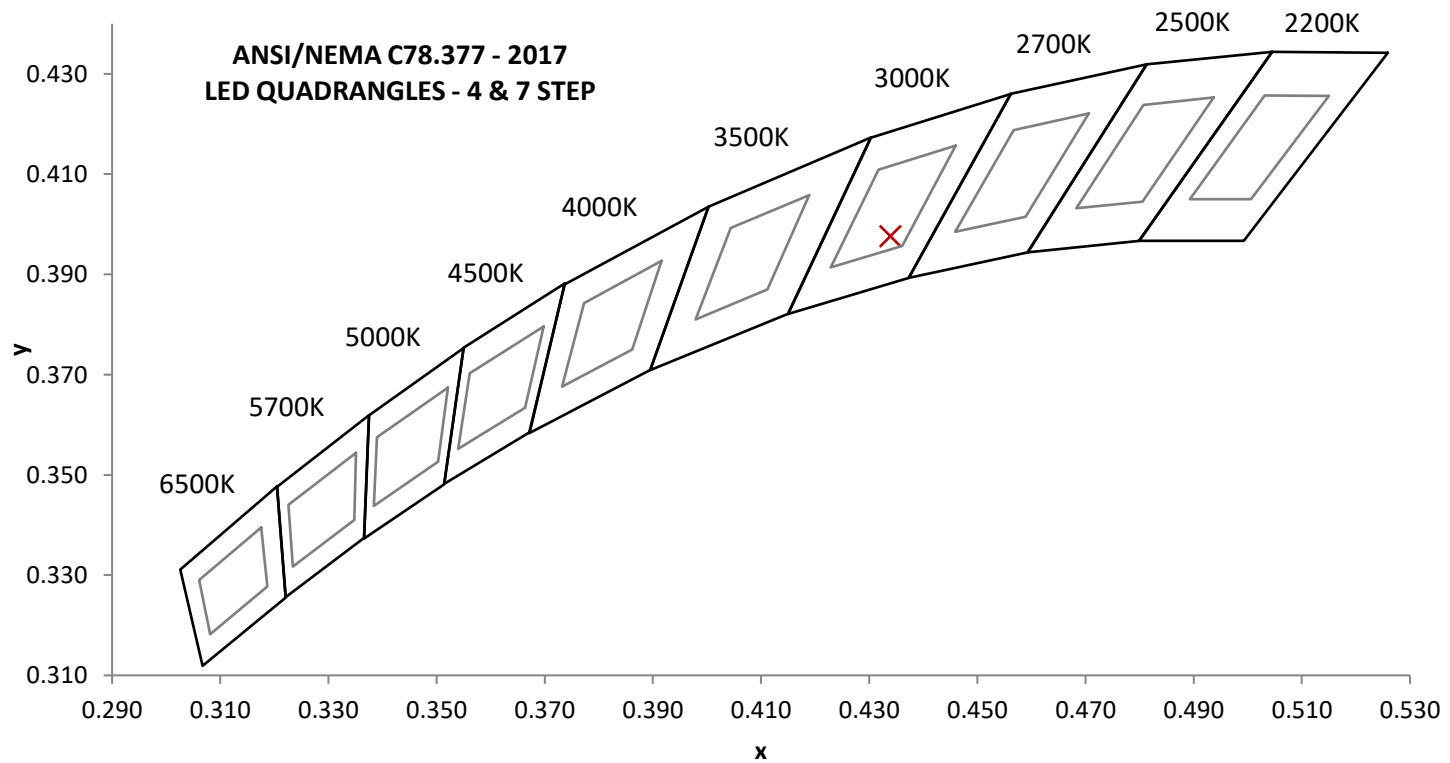
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
120.02	125.4	14.82	0.000	15.27

Measured at 120.02(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
943.6	63.7	2998	92.6	73.3

Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0022	0.434	0.398	0.251	0.518

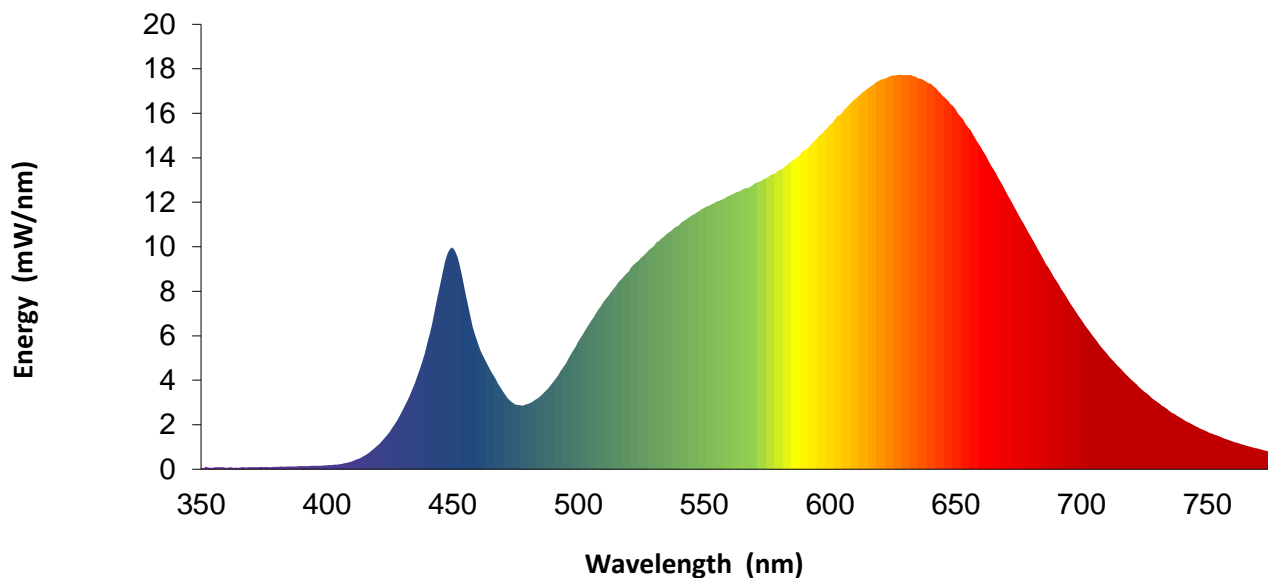


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	5.7		570	12.8		680	10.4
355	0.1		465	4.5		575	13.1		685	9.4
360	0.1		470	3.5		580	13.5		690	8.5
365	0.1		475	2.9		585	13.9		695	7.6
370	0.1		480	2.9		590	14.4		700	6.7
375	0.1		485	3.3		595	14.9		705	5.9
380	0.1		490	3.9		600	15.5		710	5.2
385	0.1		495	4.8		605	16.1		715	4.6
390	0.1		500	5.8		610	16.7		720	4.0
395	0.2		505	6.7		615	17.1		725	3.5
400	0.2		510	7.5		620	17.5		730	3.0
405	0.2		515	8.3		625	17.7		735	2.6
410	0.4		520	8.9		630	17.7		740	2.3
415	0.6		525	9.5		635	17.6		745	1.9
420	1.0		530	10.0		640	17.3		750	1.7
425	1.7		535	10.6		645	16.8		755	1.5
430	2.6		540	11.0		650	16.2		760	1.3
435	3.9		545	11.4		655	15.4		765	1.1
440	5.7		550	11.7		660	14.5		770	0.9
445	8.3		555	12.0		665	13.5		775	0.8
450	10.0		560	12.3		670	12.5		780	0.7
455	8.0		565	12.6		675	11.4		---	---

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

REPORT NO. 104941221CHI-077

#	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
1	EC2RS-159303DN-UNV-W	NA

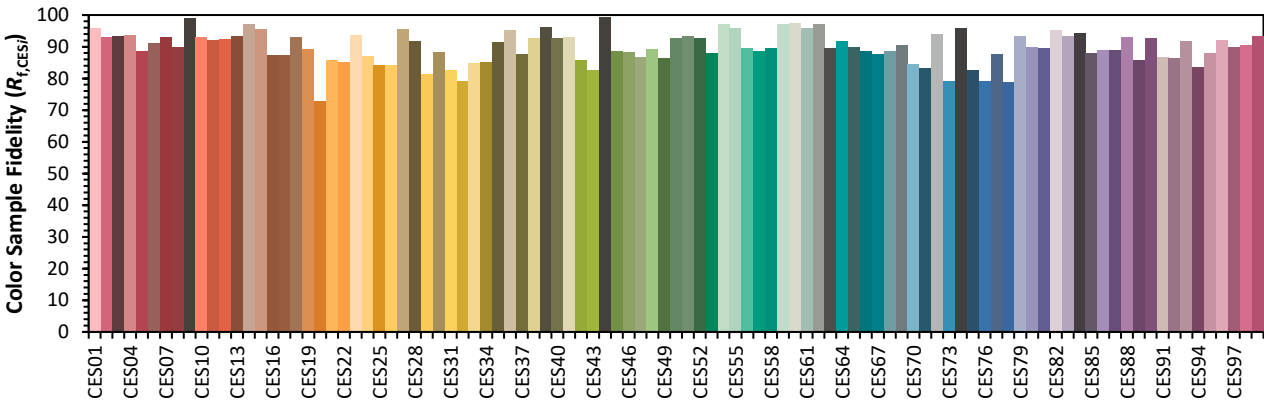
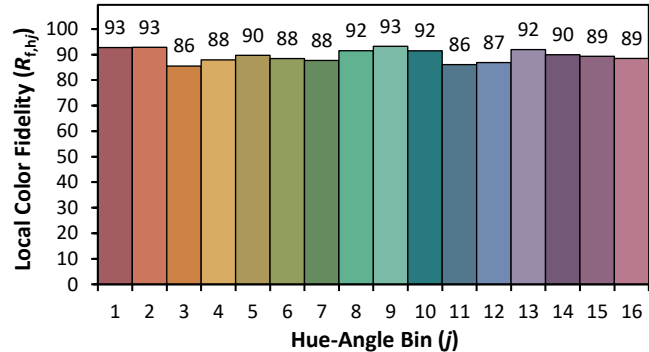
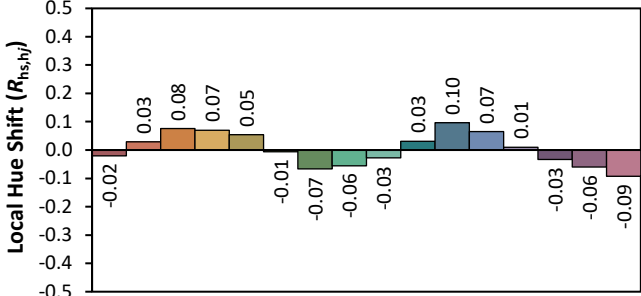
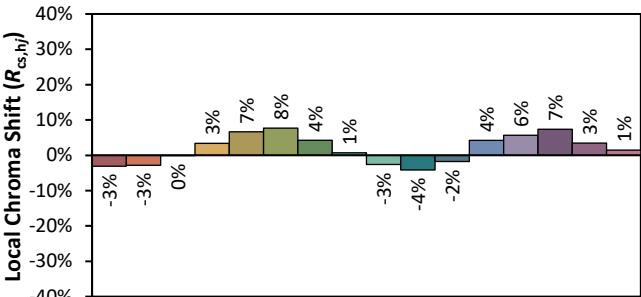
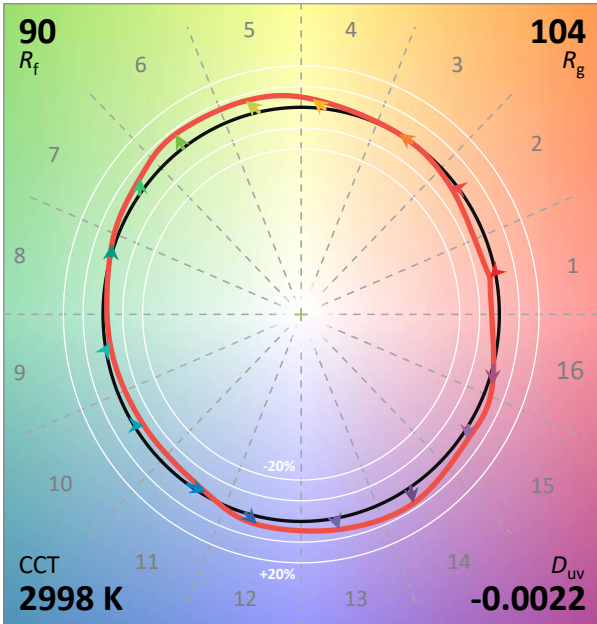
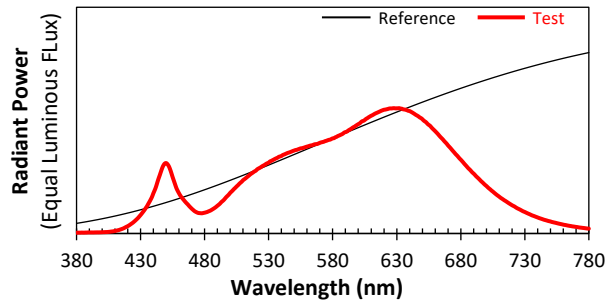
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 9/1/2022

Model: EC2RS-159303DN-UNV-W



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

x 0.4339
y 0.3976
u' 0.2514
v' 0.5183