

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

EC3RS-198354DN-UNV-W

## PROJECT NUMBER

G104941221

## REPORT NUMBER

104941221CHI-084

## ISSUE DATE

9/30/2022

## REVISED DATE

None

## TEST DATES

2022-09-01 through 2022-09-28.

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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**REPORT NUMBER**

104941221CHI-084

**MODEL NUMBER(s)**

EC3RS-198354DN-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**

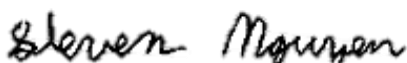
IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

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-084**

**ITEMS RECEIVED**

Item No.	Control No.	Model No.	Description	Type	Received
1	AH08252022081536	EC3RS-198354DN-UNV-W	3" DOWNLIGHT LUMINAIRE	Production	8/25/2022

**TESTED SAMPLE CONFIGURATIONS**

Config No.	Tested Model No.	Item Nos. Utilized
1	EC3RS-198354DN-UNV-W	1

**SAMPLE PHOTOS - TESTED CONFIGURATIONS**



## SUMMARY

REPORT NO. 104941221CHI-084

### PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	EC3RS-198354DN-UNV-W
Product Description:	3" DOWNLIGHT LUMINAIRE
LED Model No.:	Bridgelux / BXRE-35E2000-C-81
Driver Model No.:	ERP / ESS030W-0500-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	2306.9	2222.3
Input Power (W) @ 120VAC (Vac)	19.69	19.62
Lumen Efficacy (lm/W)	117.2	113.2
Input Power Factor (I) @ 120VAC (Vac)	0.986	0.990

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	11.48
Correlated Color Temperature (K)	3516
Color Rendering Index - Ra (I)	81.6
Color Rendering Index - R9 (I)	7.6
Duv (I)	0.0006
Chromaticity Coordinate (x)	0.405
Chromaticity Coordinate (y)	0.392
Chromaticity Coordinate (u')	0.235
Chromaticity Coordinate (v')	0.512

## 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**

**REPORT NO. 104941221CHI-084**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RS-198354DN-UNV-W	NA

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

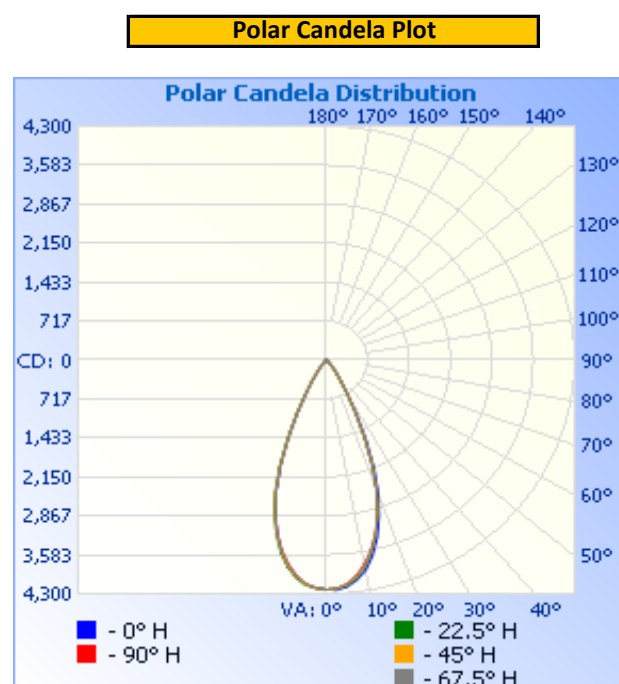
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )
Up	120.08	166.3	19.69	0.986

Light Output (lm)	Lumen Efficacy (lm/W)
2306.9	117.2

**INTENSITY SUMMARY - CANDELA**

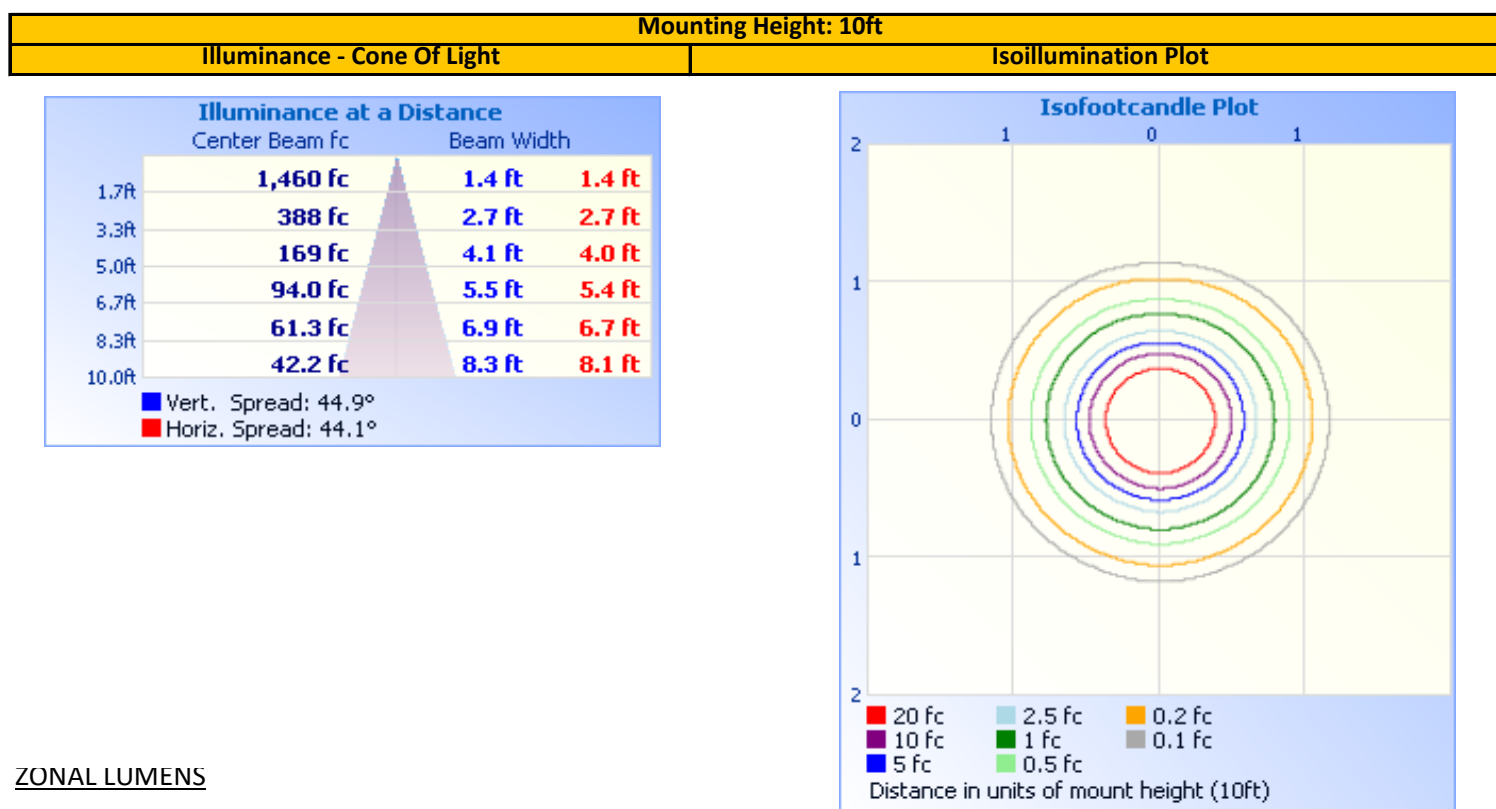
Angle	0	22.5	45	67.5	90
0	4221	4221	4221	4221	4221
5	4182	4163	4147	4135	4128
10	3921	3873	3851	3830	3807
15	3388	3316	3299	3295	3291
20	2631	2544	2545	2532	2539
25	1628	1544	1542	1534	1542
30	761	717	723	737	752
35	333	315	317	322	327
40	157	148	148	148	151
45	74	71	71	71	72
50	32	30	30	30	30
55	13	13	13	13	13
60	9	9	9	9	9
65	6	6	6	6	6
70	3	3	3	3	3
75	2	2	2	2	2
80	1	1	1	1	1
85	1	1	1	1	1
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



REPORT NO. 104941221CHI-084

# ILLUMINANCE SUMMARY



# ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	2,003.2	86.8%	0-10	385.5	16.7%
0-40	2,226.0	96.5%	10-20	906.9	39.3%
0-60	2,298.3	99.6%	20-30	710.8	30.8%
60-90	8.6	0.4%	30-40	222.7	9.7%
70-100	2.9	0.1%	40-50	59.2	2.6%
90-120	0.0	0.0%	50-60	13.1	0.6%
0-90	2,306.9	100.0%	60-70	5.7	0.2%
90-180	0.0	0.0%	70-80	2.2	0.1%
0-180	2,306.9	100.0%	80-90	0.7	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**

**REPORT NO. 104941221CHI-084**

Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RS-198354DN-UNV-W	NA

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

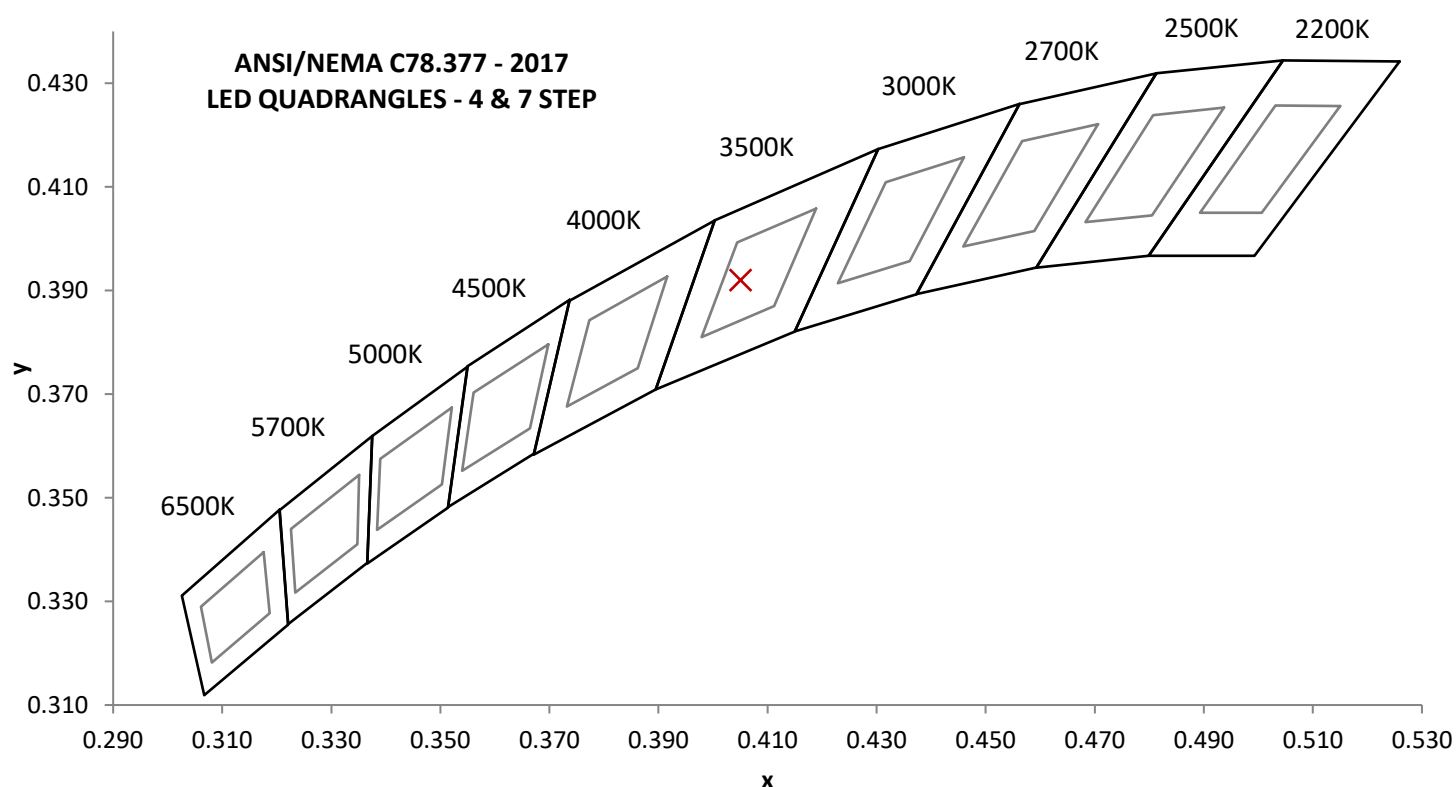
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Input ATHD (%)
120.02	165.1	19.62	0.990	11.48

## **Measured at 120.02(Vac)**

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ( )	CRI - R9 ( )
2222.3	113.2	3516	81.6	7.6

Duv ( )	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0006	0.405	0.392	0.235	0.512

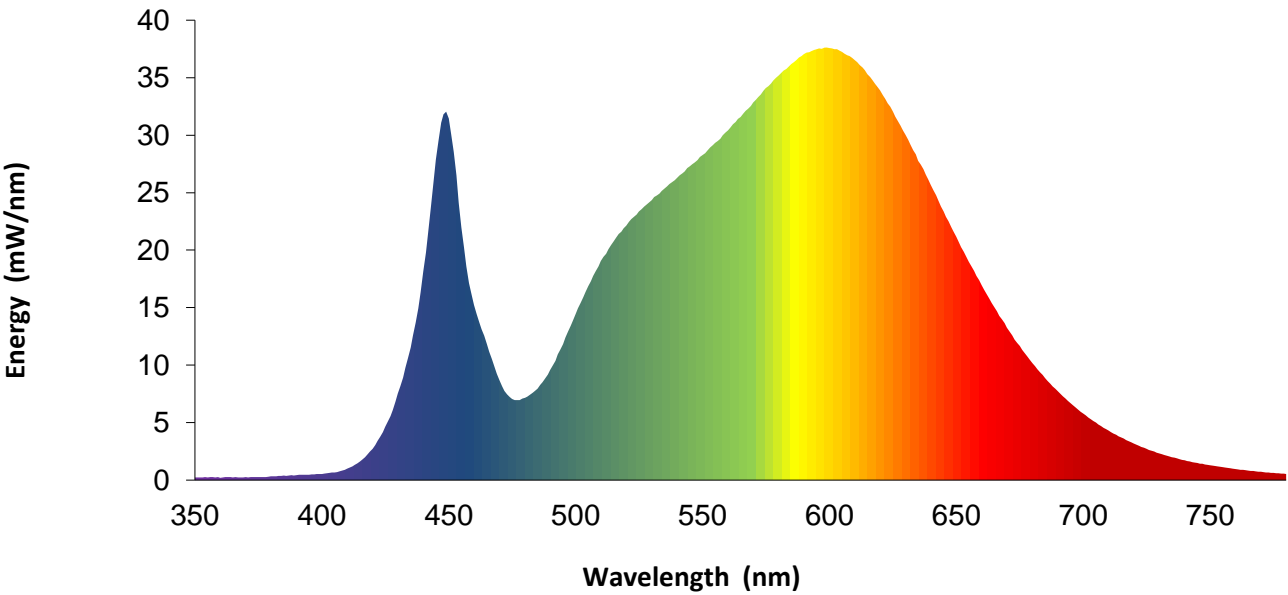


REPORT NO. 104941221CHI-084

SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	15.2		570	32.8		680	10.2
355	0.2		465	11.8		575	34.1		685	8.9
360	0.2		470	8.7		580	35.2		690	7.7
365	0.2		475	7.0		585	36.2		695	6.7
370	0.3		480	7.1		590	37.0		700	5.8
375	0.3		485	8.0		595	37.5		705	5.0
380	0.3		490	9.6		600	37.6		710	4.3
385	0.4		495	11.8		605	37.2		715	3.7
390	0.4		500	14.5		610	36.5		720	3.2
395	0.5		505	16.9		615	35.3		725	2.7
400	0.5		510	19.1		620	33.9		730	2.3
405	0.7		515	20.8		625	32.0		735	2.0
410	1.0		520	22.1		630	30.0		740	1.7
415	1.6		525	23.3		635	27.8		745	1.5
420	2.7		530	24.3		640	25.7		750	1.3
425	4.6		535	25.3		645	23.3		755	1.1
430	7.5		540	26.3		650	21.2		760	1.0
435	11.5		545	27.3		655	19.0		765	0.8
440	18.2		550	28.3		660	16.9		770	0.7
445	27.9		555	29.3		665	15.0		775	0.6
450	31.5		560	30.4		670	13.2		780	0.5
455	22.0		565	31.6		675	11.6		---	---

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-084**

#	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**

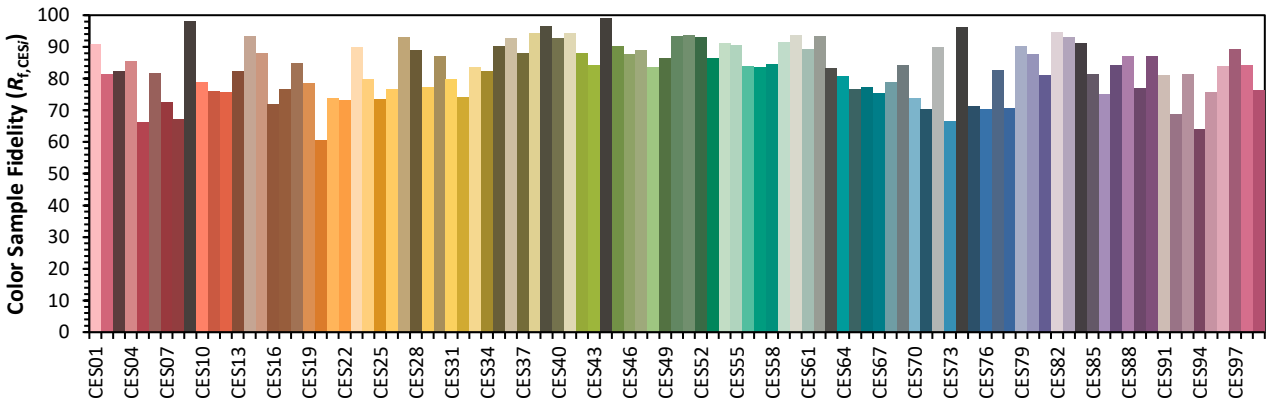
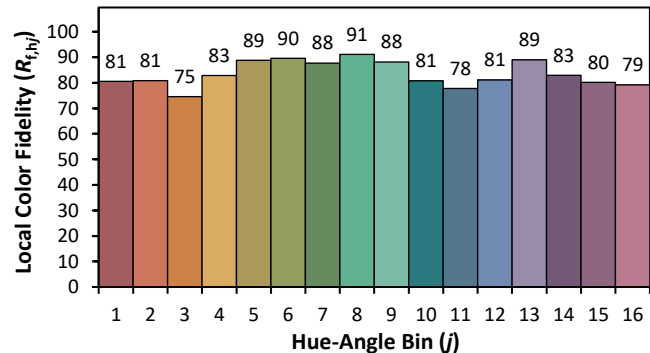
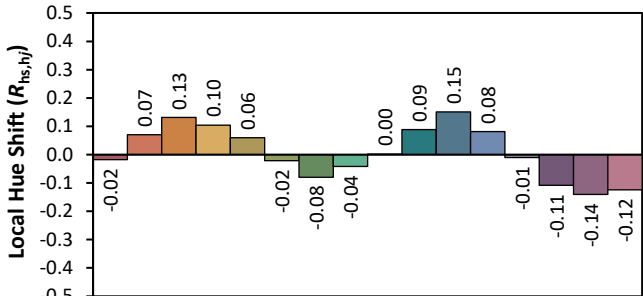
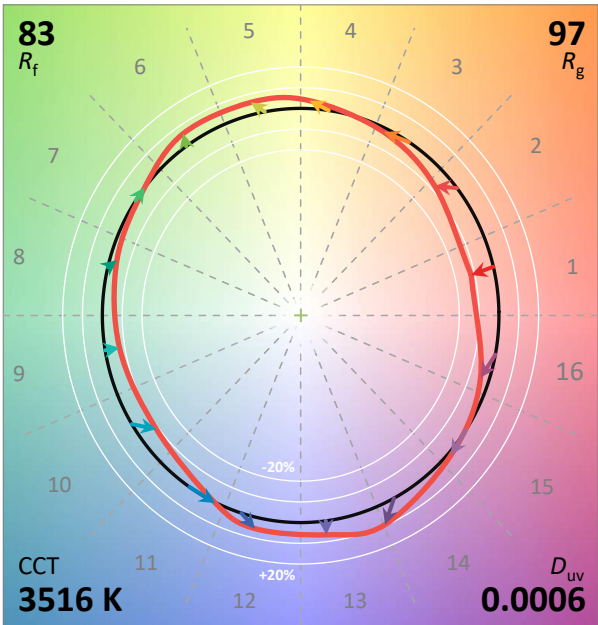
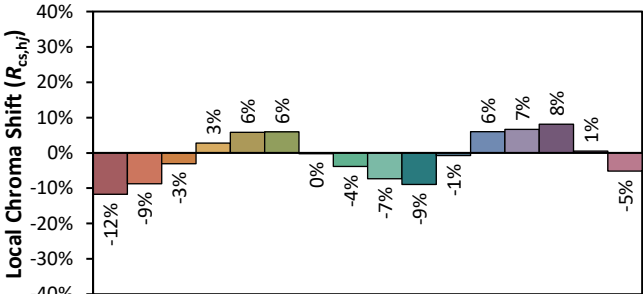
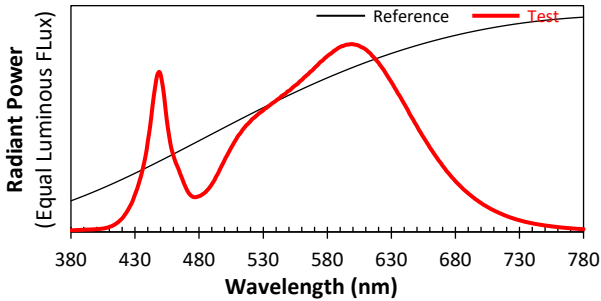
#	Revision Date	Updated By	Reviewed By	Description of Change
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RS-198354DN-UNV-W	NA

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD  
Date: 9/1/2022

Manufacturer: VISUAL COMFORT AND COMPANY  
Model: EC3RS-198354DN-UNV-W



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

x 0.4050  
y 0.3920  
u' 0.2350  
v' 0.5117