

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

EC3RS-199302DN-UNV-W

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CHI-086

ISSUE DATE

9/30/2022

REVISED DATE

None

TEST DATES

2022-09-02 through 2022-09-27.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CHI-086

MODEL NUMBER(s)

EC3RS-199302DN-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

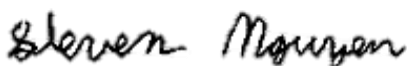
IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

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:



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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	AH08252022081536	EC3RS-199302DN-UNV-W	3" DOWNLIGHT LUMINAIRE	Production	8/25/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	EC3RS-199302DN-UNV-W	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	EC3RS-199302DN-UNV-W
Product Description:	3" DOWNLIGHT LUMINAIRE
LED Model No.:	Bridgelux / BXRE-30G2000-C-81
Driver Model No.:	ERP / ESS030W-0500-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1434.3	1405.1
Input Power (W) @ 120VAC (Vac)	19.69	19.67
Lumen Efficacy (lm/W)	72.8	71.4
Input Power Factor (I) @ 120VAC (Vac)	0.986	0.991

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	11.47
Correlated Color Temperature (K)	3009
Color Rendering Index - Ra (I)	91.8
Color Rendering Index - R9 (I)	68.5
Duv (I)	-0.0012
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.400
Chromaticity Coordinate (u')	0.251
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
1	EC3RS-199302DN-UNV-W	NA

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

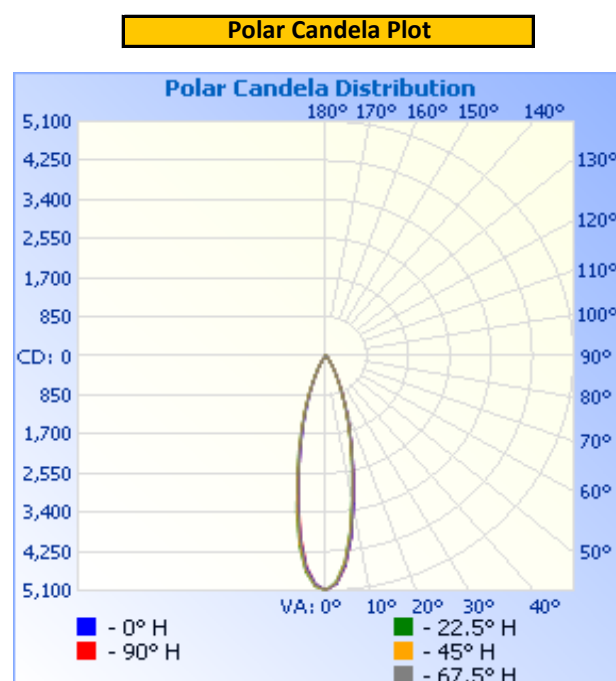
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.07	166.4	19.69	0.986

Light Output (lm)	Lumen Efficacy (lm/W)
1434.3	72.8

INTENSITY SUMMARY - CANDELA

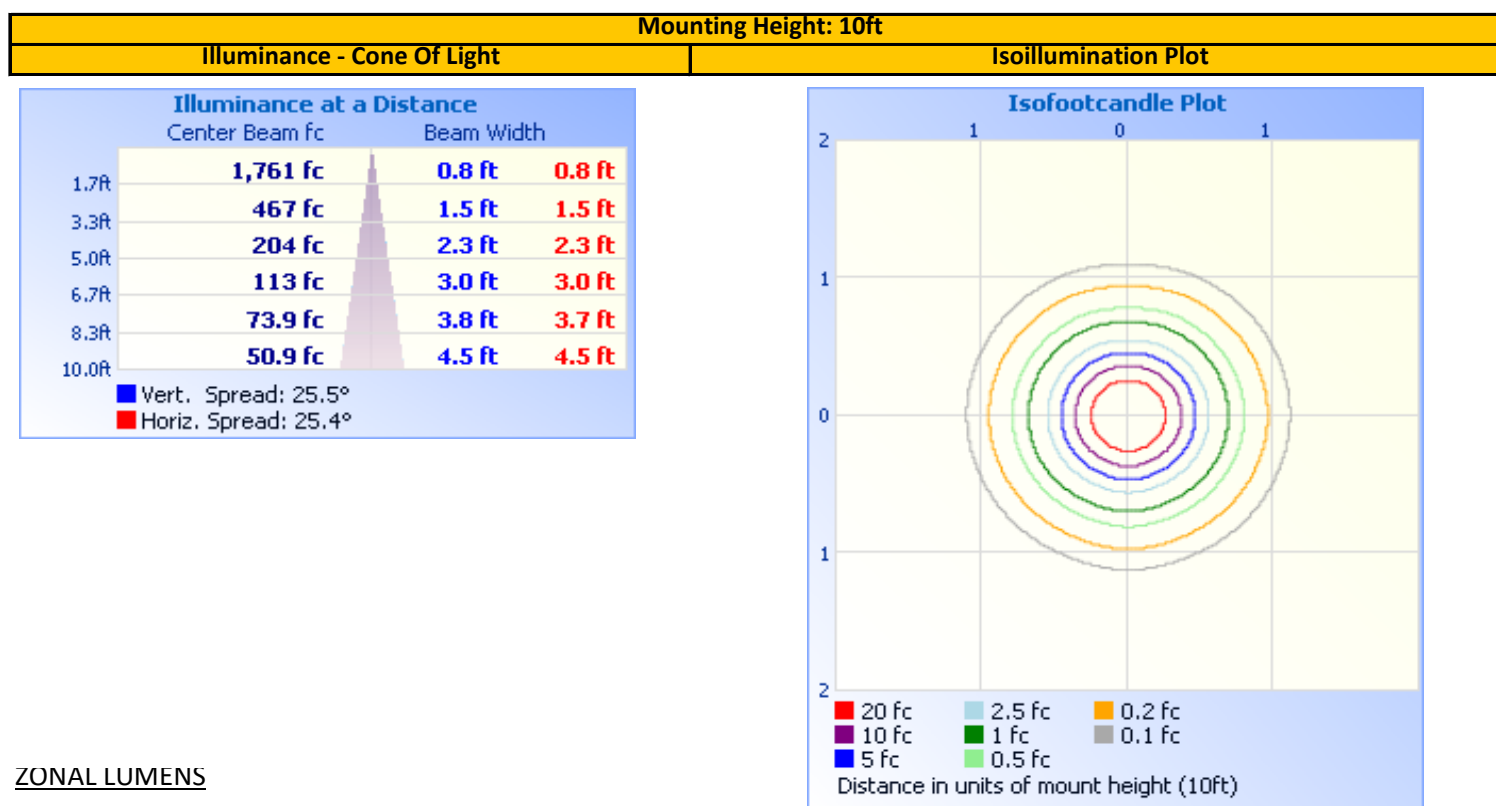
Angle	0	22.5	45	67.5	90
0	5090	5090	5090	5090	5090
5	4570	4488	4495	4546	4591
10	3264	3115	3165	3203	3260
15	2051	1957	1982	2015	2038
20	1205	1147	1165	1184	1200
25	638	595	608	623	636
30	323	300	299	306	314
35	172	159	158	162	166
40	87	80	79	81	83
45	47	44	44	44	46
50	27	24	25	25	26
55	15	15	15	15	15
60	14	13	13	13	13
65	10	10	9	10	9
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



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	1,263.3	88.1%	0-10	392.6	27.4%
0-40	1,371.6	95.6%	10-20	568.0	39.6%
0-60	1,422.9	99.2%	20-30	302.8	21.1%
60-90	11.4	0.8%	30-40	108.2	7.5%
70-100	3.0	0.2%	40-50	36.9	2.6%
90-120	0.0	0.0%	50-60	14.5	1.0%
0-90	1,434.3	100.0%	60-70	8.3	0.6%
90-180	0.0	0.0%	70-80	2.4	0.2%
0-180	1,434.3	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

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RS-199302DN-UNV-W	NA

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

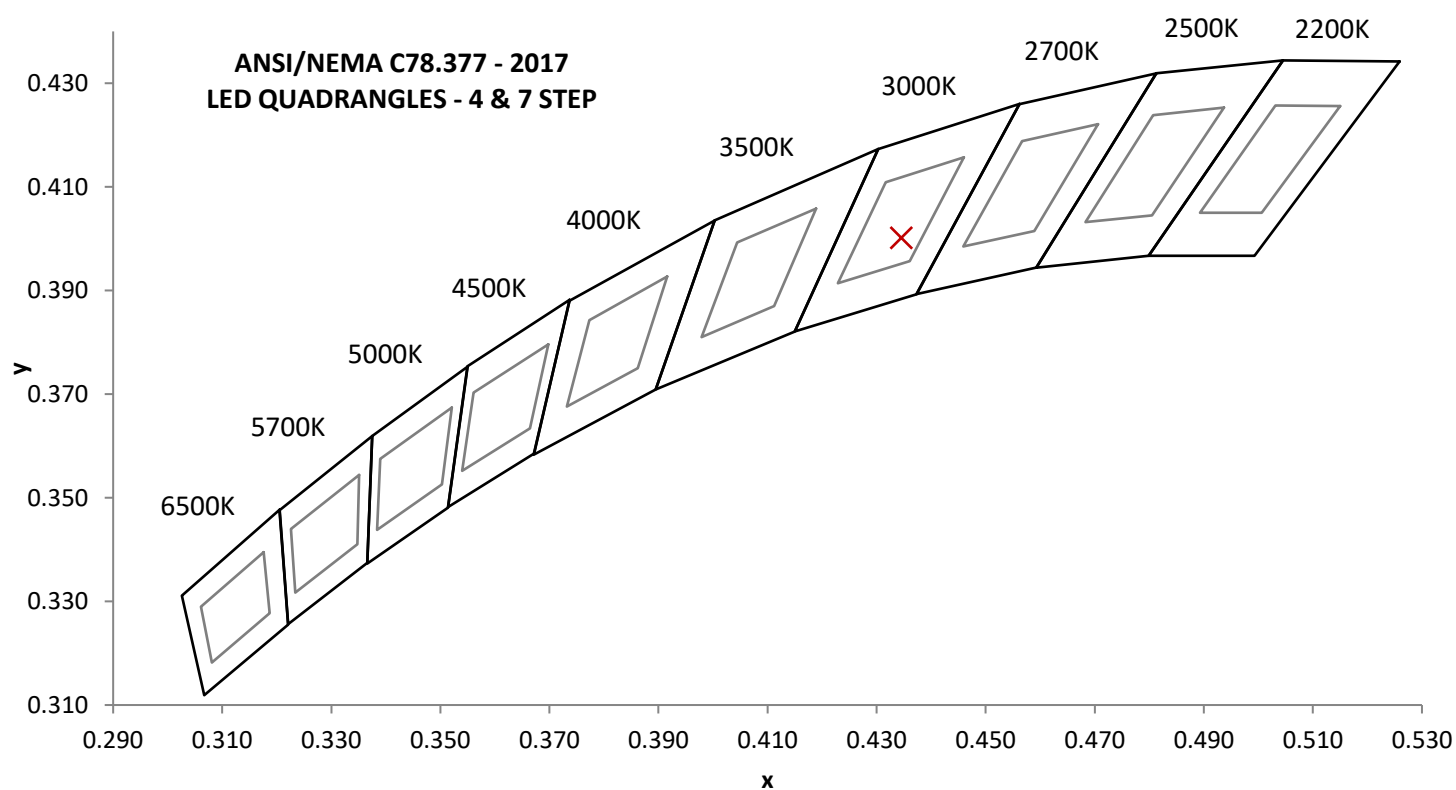
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.00	165.5	19.67	0.991	11.47

Measured at 120(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
1405.1	71.4	3009	91.8	68.5

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0012	0.435	0.400	0.251	0.519

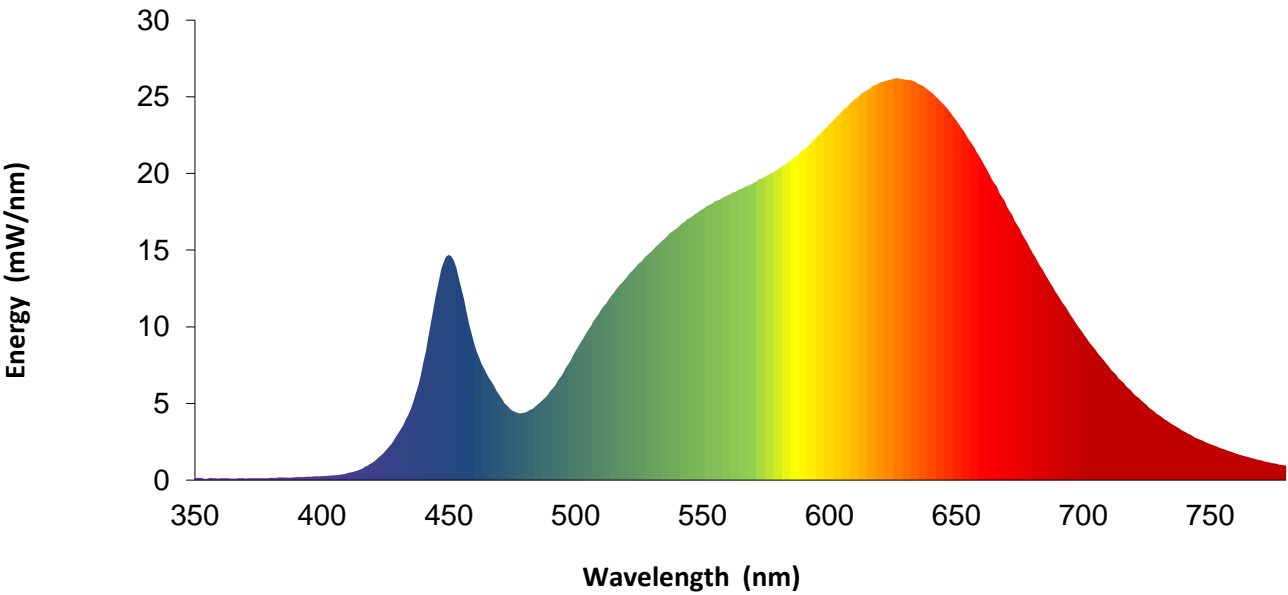


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	9.0		570	19.4		680	14.8
355	0.1		465	6.9		575	19.8		685	13.4
360	0.1		470	5.5		580	20.3		690	12.1
365	0.1		475	4.5		585	20.9		695	10.8
370	0.1		480	4.4		590	21.6		700	9.6
375	0.1		485	4.9		595	22.4		705	8.4
380	0.1		490	5.8		600	23.2		710	7.4
385	0.2		495	7.0		605	24.1		715	6.5
390	0.2		500	8.4		610	24.9		720	5.6
395	0.2		505	9.8		615	25.4		725	4.9
400	0.3		510	11.1		620	25.9		730	4.2
405	0.3		515	12.2		625	26.2		735	3.6
410	0.4		520	13.2		630	26.1		740	3.2
415	0.7		525	14.1		635	25.8		745	2.7
420	1.2		530	14.9		640	25.3		750	2.4
425	1.9		535	15.7		645	24.5		755	2.0
430	3.0		540	16.4		650	23.5		760	1.8
435	4.6		545	17.1		655	22.2		765	1.5
440	7.7		550	17.7		660	20.8		770	1.3
445	12.1		555	18.2		665	19.4		775	1.1
450	14.7		560	18.6		670	17.8		780	0.9
455	12.5		565	19.0		675	16.4		---	---

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

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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

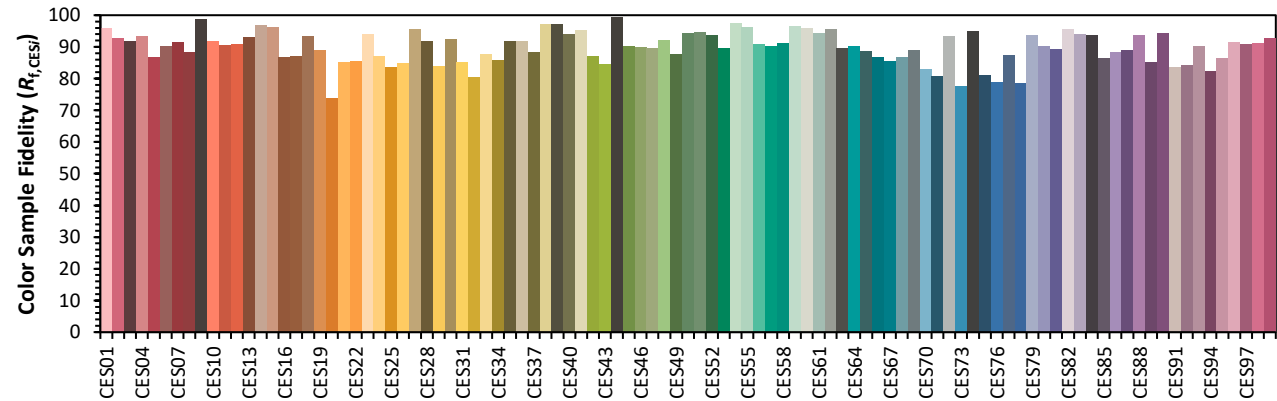
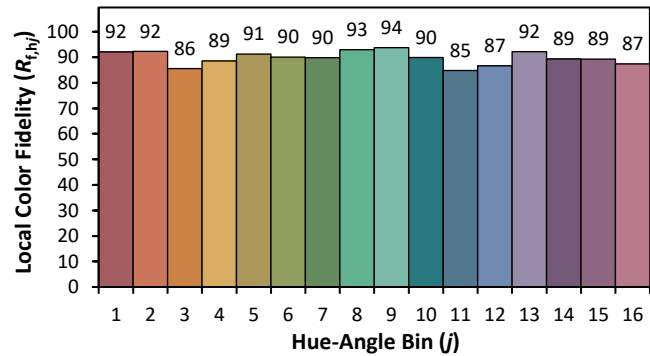
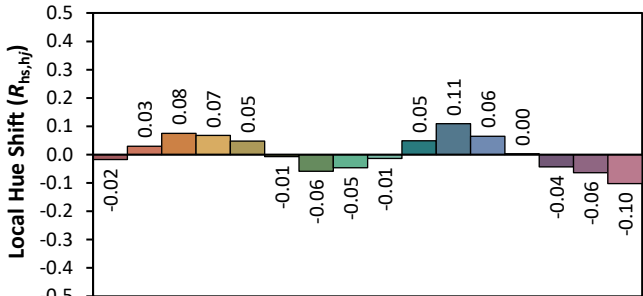
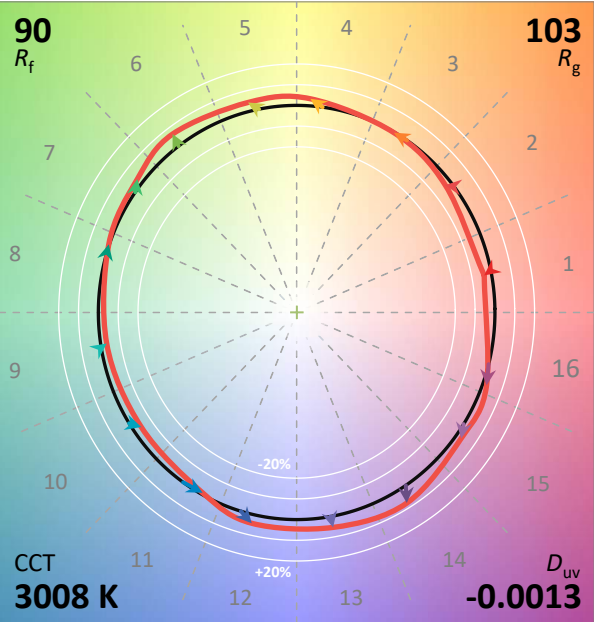
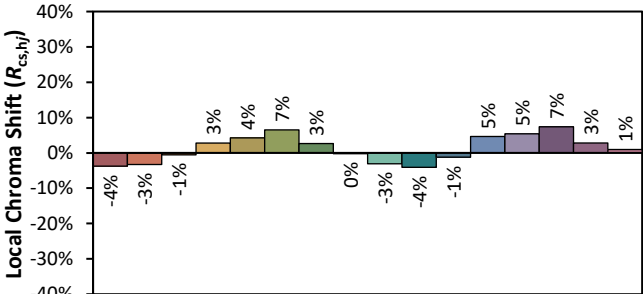
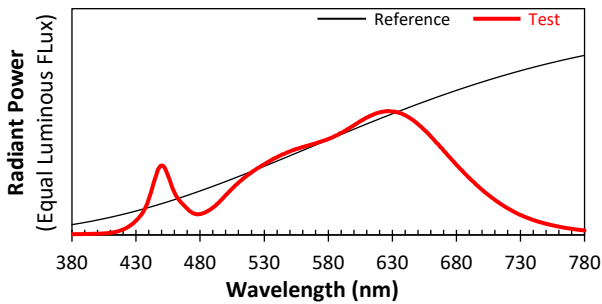
#	Revision Date	Updated By	Reviewed By	Description of Change
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	EC3RS-199302DN-UNV-W	NA

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD
Date: 9/2/2022

Manufacturer: VISUAL COMFORT AND COMPANY
Model: EC3RS-199302DN-UNV-W



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

x 0.4345
y 0.4001
u' 0.2507
v' 0.5194