

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700FMSEN17NB-LED927

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CHI-030

ISSUE DATE

5/26/2022

REVISED DATE

None

TEST DATES

2022-05-24.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CHI-030

MODEL NUMBER(s)

700FMS17NB-LED927

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:



Nick Lau
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Reviewer:



Jeff Davis
N.A. Technical Lead
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SAMPLE INFORMATION

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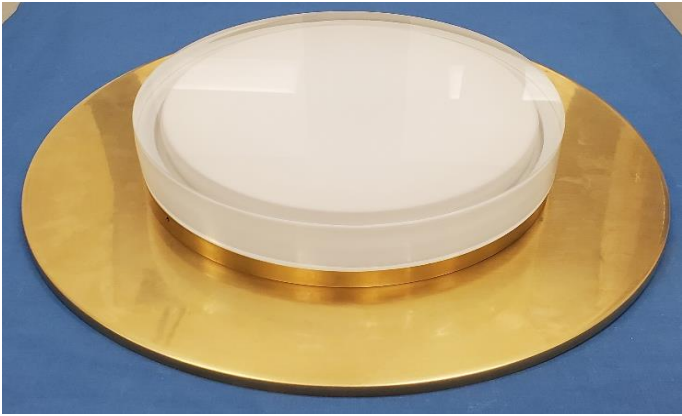
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH05232022114034	700FMSEN17NB-LED927	Sen 17 Flush Mount	Production	5/23/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700FMSEN17NB-LED927	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700FMSEN17NB-LED927
Product Description:	Sen 17 Flush Mount
LED Model No.:	R9-DC-36V-XXY
Driver Model No.:	ISDU-D56-15W
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	872.7	910.5
Input Power (W) @ 120 (Vac)	29.69	29.69
Lumen Efficacy (lm/W)	29.4	30.7
Input Power Factor (I) @ 120 (Vac)	0.977	0.977

Criteria	Results
Input ATHD (%) @ 120 (Vac)	21.60
Correlated Color Temperature (K)	2389
Color Rendering Index - Ra (I)	92.9
Color Rendering Index - R9 (I)	60.3
Duv (I)	-0.0015
Chromaticity Coordinate (x)	0.484
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.279
Chromaticity Coordinate (v')	0.531
Input Power (W) @ 277 (Vac)	30.28
Input Power Factor (I) @ 277 (Vac)	0.977
Input ATHD (%) @ 277 (Vac)	21.18

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	700FMSEN17NB-LED927	NA

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

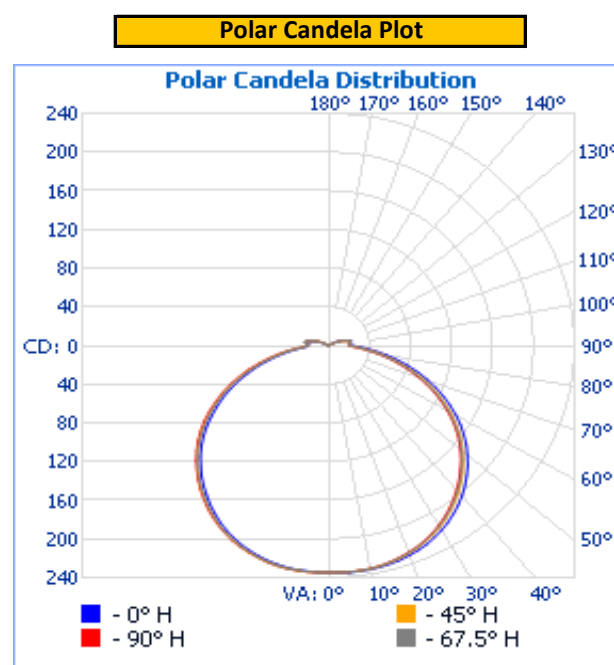
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.01	253.2	29.69	0.977

Light Output (lm)	Lumen Efficacy (lm/W)
872.7	29.4

INTENSITY SUMMARY - CANDELA

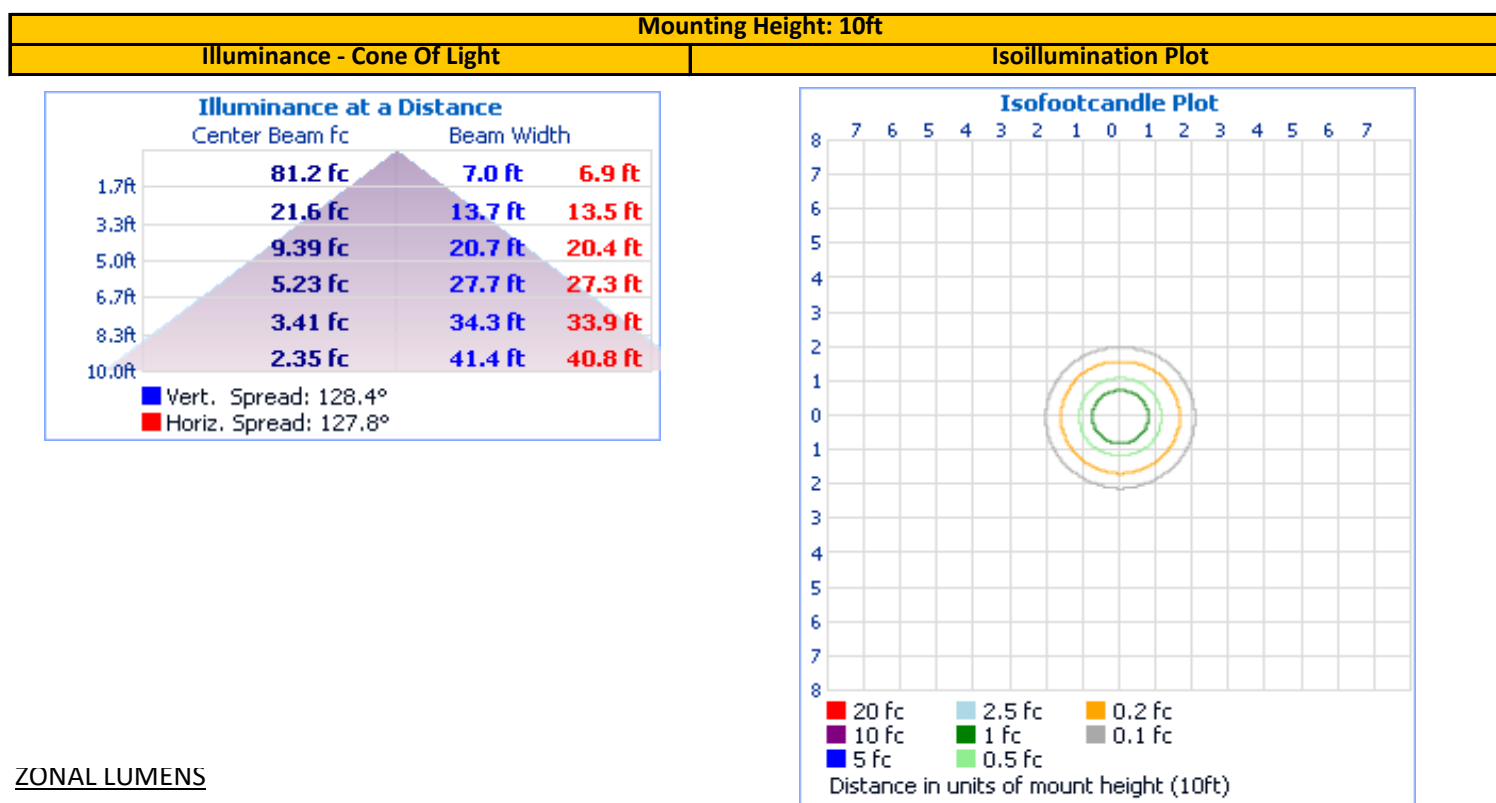
Angle	0	22.5	45	67.5	90
0	234.8	234.8	234.8	234.8	234.8
5	235.4	235.0	234.8	235.0	234.9
10	235.0	234.4	234.4	234.1	234.0
15	233.5	232.4	232.3	231.9	231.7
20	230.6	229.0	228.7	228.1	227.6
25	226.6	224.4	223.6	223.0	222.3
30	220.4	217.7	217.0	215.8	214.8
35	212.3	209.1	208.0	206.7	205.4
40	202.6	198.7	197.4	195.8	194.3
45	190.6	186.4	185.0	183.3	181.8
50	176.8	172.7	171.2	169.5	168.0
55	161.2	156.7	155.3	153.5	152.0
60	143.4	138.5	137.1	135.3	133.5
65	123.6	118.4	117.3	115.3	113.5
70	102.6	97.7	96.4	94.3	92.3
75	80.3	75.5	74.2	72.5	70.3
80	58.1	54.2	53.0	51.1	49.2
85	39.0	35.8	34.6	33.0	31.3
90	23.9	22.6	22.0	21.2	20.5
95	20.8	20.2	20.0	19.6	19.5
100	22.4	22.1	21.8	21.8	22.0
105	20.8	20.0	19.9	19.6	19.4
110	16.2	15.2	15.1	14.8	14.5
115	11.0	9.8	9.6	9.4	9.0
120	4.3	3.5	3.4	3.4	3.1
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	190.5	21.8%	0-10	22.4	2.6%
0-40	319.5	36.6%	10-20	65.5	7.5%
0-60	596.7	68.4%	20-30	102.7	11.8%
60-90	223.7	25.6%	30-40	129.0	14.8%
70-100	133.8	15.3%	40-50	141.0	16.2%
90-120	51.7	5.9%	50-60	136.1	15.6%
0-90	820.4	94.0%	60-70	112.6	12.9%
90-180	52.3	6.0%	70-80	74.9	8.6%
0-180	872.7	100.0%	80-90	36.2	4.1%
			90-100	22.7	2.6%
			100-110	20.2	2.3%
			110-120	8.8	1.0%
			120-130	0.6	0.1%
			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	700FMSEN17NB-LED927	NA

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

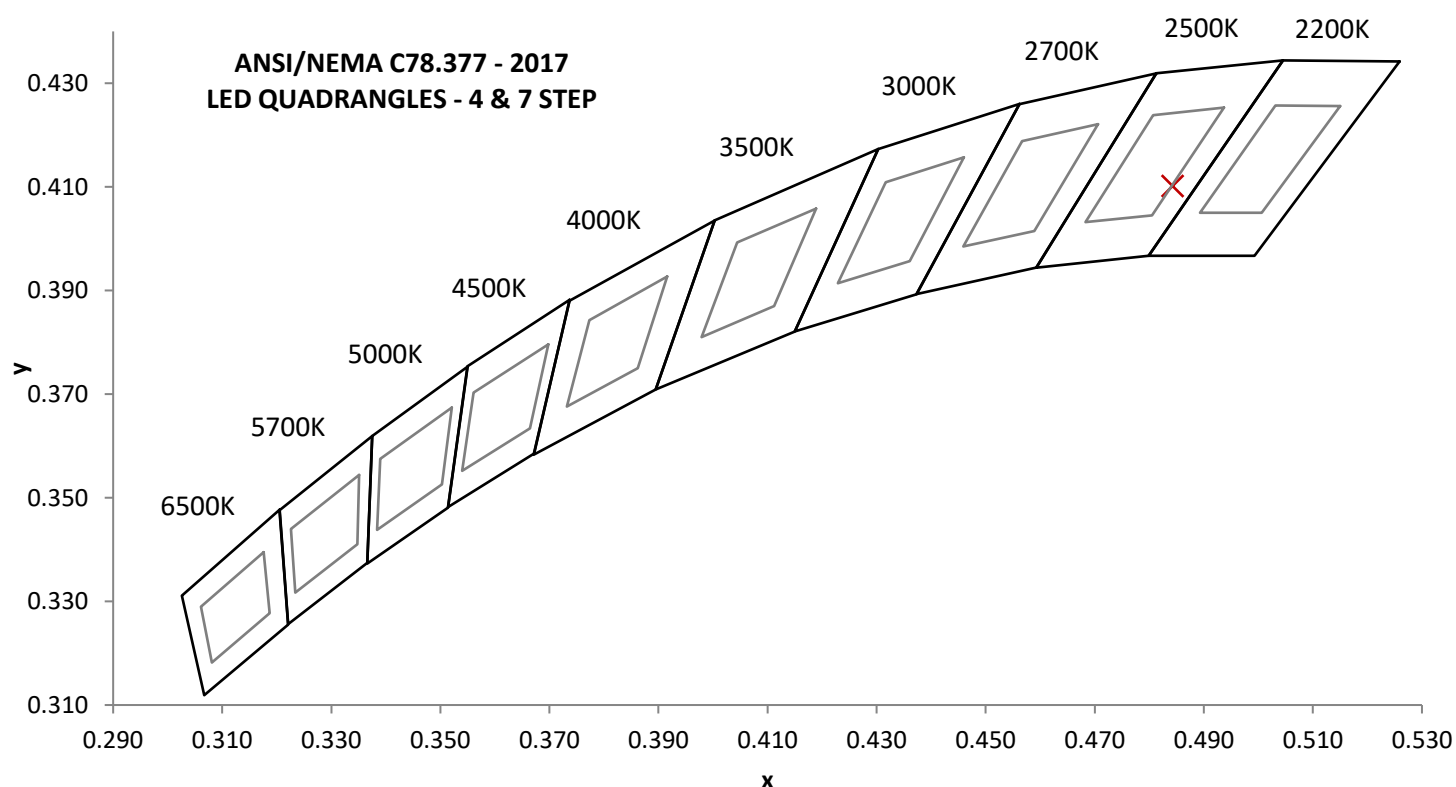
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.03	253.2	29.69	0.977	21.60
277.01	111.8	30.28	0.977	21.18

Measured at 120.03(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
910.5	30.7	2389	92.9	60.3

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0015	0.484	0.410	0.279	0.531

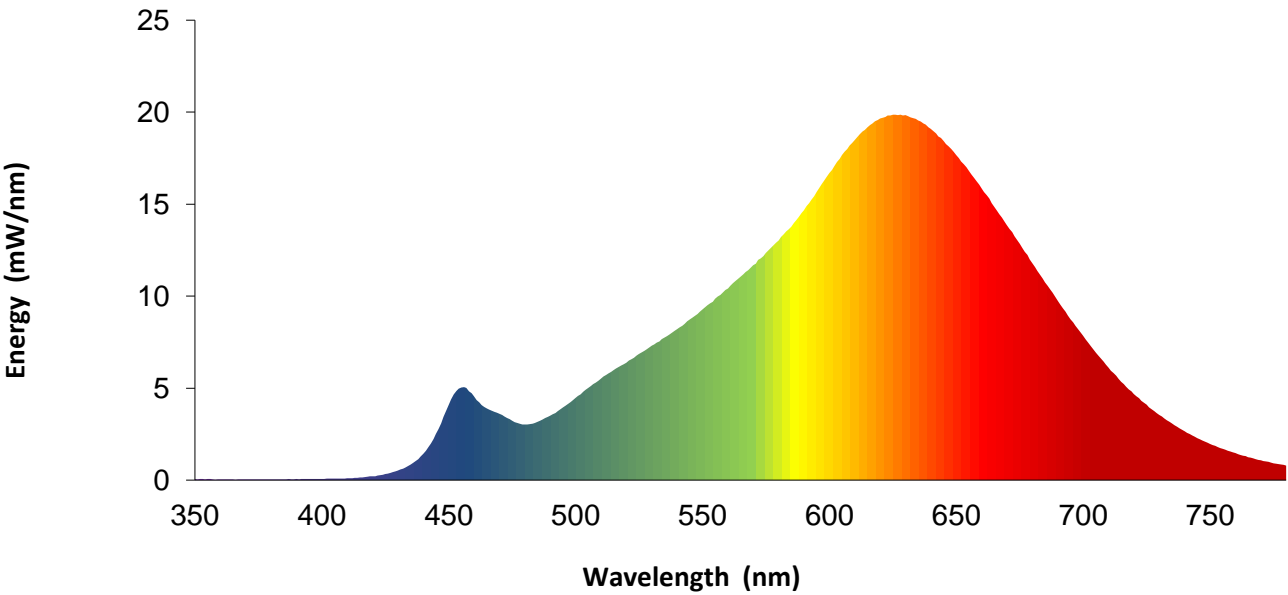


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	4.6		570	11.7		680	11.8
355	0.1		465	3.9		575	12.4		685	10.7
360	0.0		470	3.6		580	13.0		690	9.7
365	0.0		475	3.2		585	13.8		695	8.7
370	0.0		480	3.0		590	14.7		700	7.8
375	0.0		485	3.2		595	15.7		705	6.9
380	0.0		490	3.5		600	16.7		710	6.1
385	0.0		495	3.9		605	17.7		715	5.3
390	0.1		500	4.5		610	18.5		720	4.7
395	0.1		505	5.0		615	19.2		725	4.1
400	0.1		510	5.5		620	19.6		730	3.5
405	0.1		515	6.0		625	19.9		735	3.1
410	0.1		520	6.4		630	19.8		740	2.7
415	0.1		525	6.9		635	19.5		745	2.3
420	0.2		530	7.3		640	19.1		750	2.0
425	0.3		535	7.7		645	18.4		755	1.7
430	0.5		540	8.2		650	17.7		760	1.5
435	0.8		545	8.7		655	16.8		765	1.3
440	1.4		550	9.3		660	15.8		770	1.1
445	2.5		555	9.9		665	14.9		775	0.9
450	4.1		560	10.4		670	13.8		780	0.8
455	5.0		565	11.1		675	12.8		---	---

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	146767	4/4/2022	4/4/2023
17	Omega thermometer	USB TC08	EQAH002615	4/5/2022	4/5/2023
26	Xitron Power Analyzer	XT-2640	CHI0611	6/9/2021	6/9/2022

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

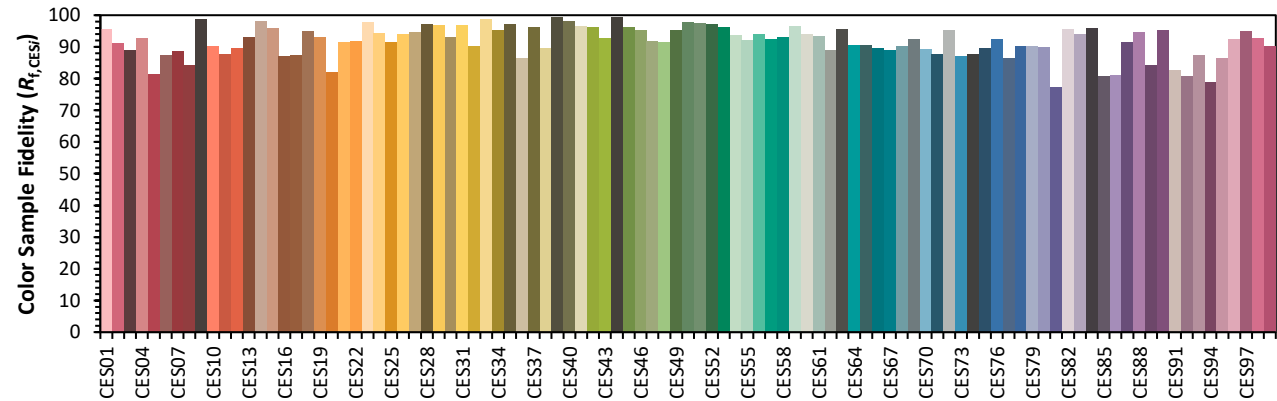
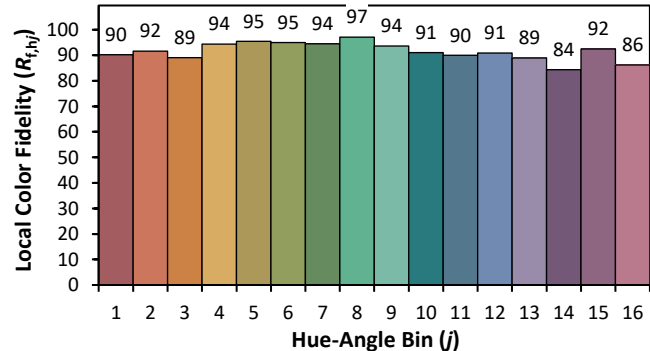
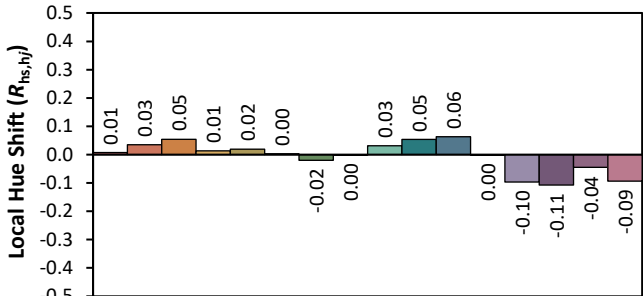
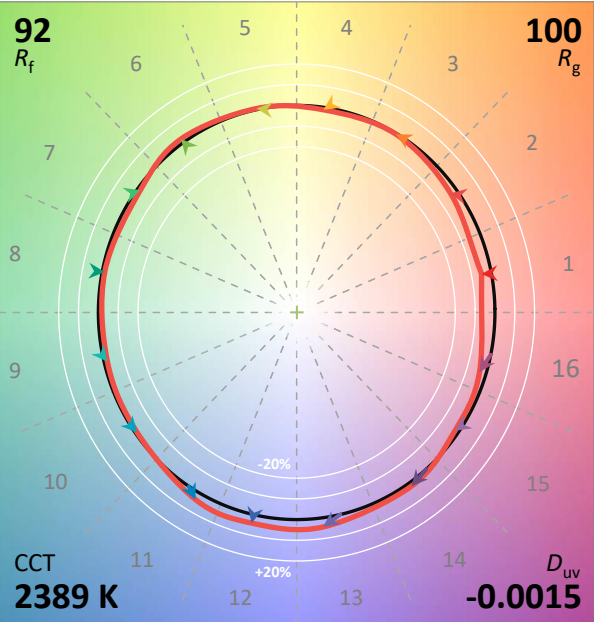
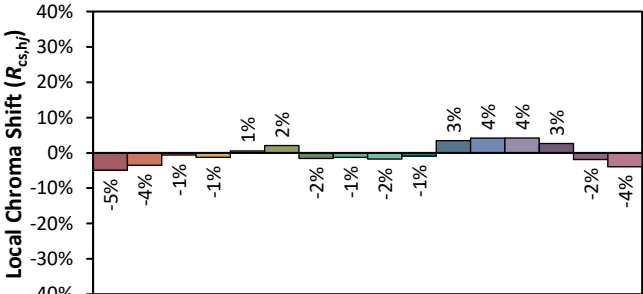
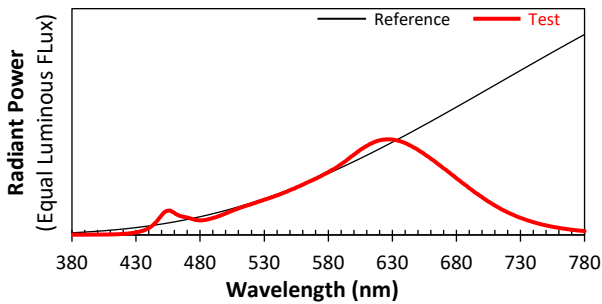
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700FMSEN17NB-LED927	NA

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD
Date: 5/24/2022

Manufacturer: VISUAL COMFORT AND COMPANY
Model: 700FMSEN17NB-LED927



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

x 0.4843
y 0.4101
u' 0.2786
v' 0.5309