

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700FMMGN13BR-LED930

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CHI-008

ISSUE DATE

10/20/2021

REVISED DATE

None

TEST DATES

10/15/2021 through 10/19/2021.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104659241CHI-008

MODEL NUMBER(s)

700FMMGN13BR-LED930

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-01166088-0.

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:



Max Carvajal
Engineer
Lighting Division

Reviewer:



Jeff Davis
N.A. Technical Lead
Lighting Division

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SAMPLE INFORMATION

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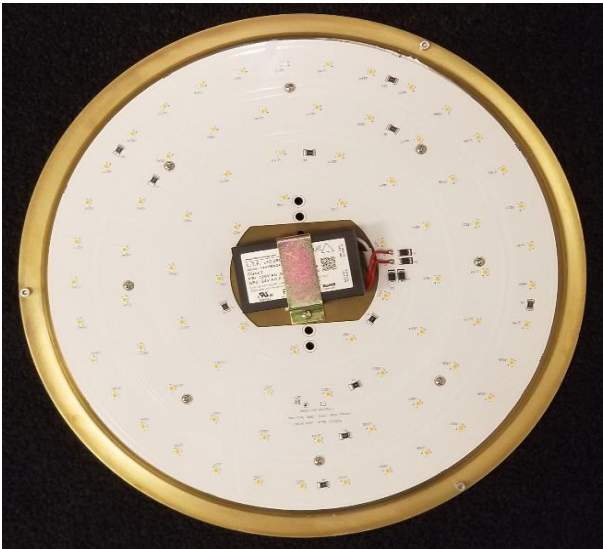
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH10142021015751-003	700FMMGN13BR-LED930	Megan Ceiling	Production	10/14/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700FMMGN13BR-LED930	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700FMMGN13BR-LED930
Product Description:	Megan Ceiling
LED Model No.:	LUMINUS 3030
Driver Model No.:	LTF TA60WA24LED65B15-0000
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	2389.3	2455.3
Input Power (W) @ 120VAC (Vac)	42.38	42.49
Lumen Efficacy (lm/W)	56.4	57.8
Input Power Factor (I) @ 120VAC (Vac)	0.916	0.937

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	36.94
Correlated Color Temperature (K)	2986
Color Rendering Index - Ra (I)	92.2
Color Rendering Index - R9 (I)	57.3
Duv (I)	-0.0017
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.399
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
1	700FMMGN13BR-LED930	NA

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

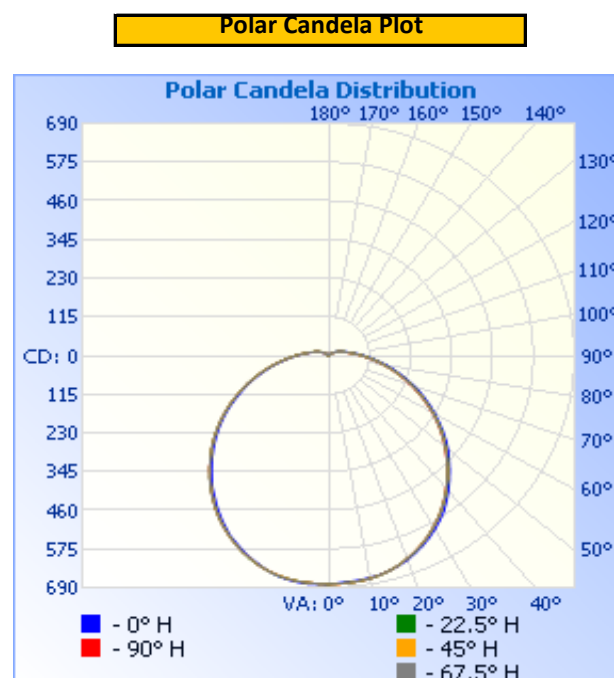
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	119.99	385.6	42.38	0.916

Light Output (lm)	Lumen Efficacy (lm/W)
2389.3	56.4

INTENSITY SUMMARY - CANDELA

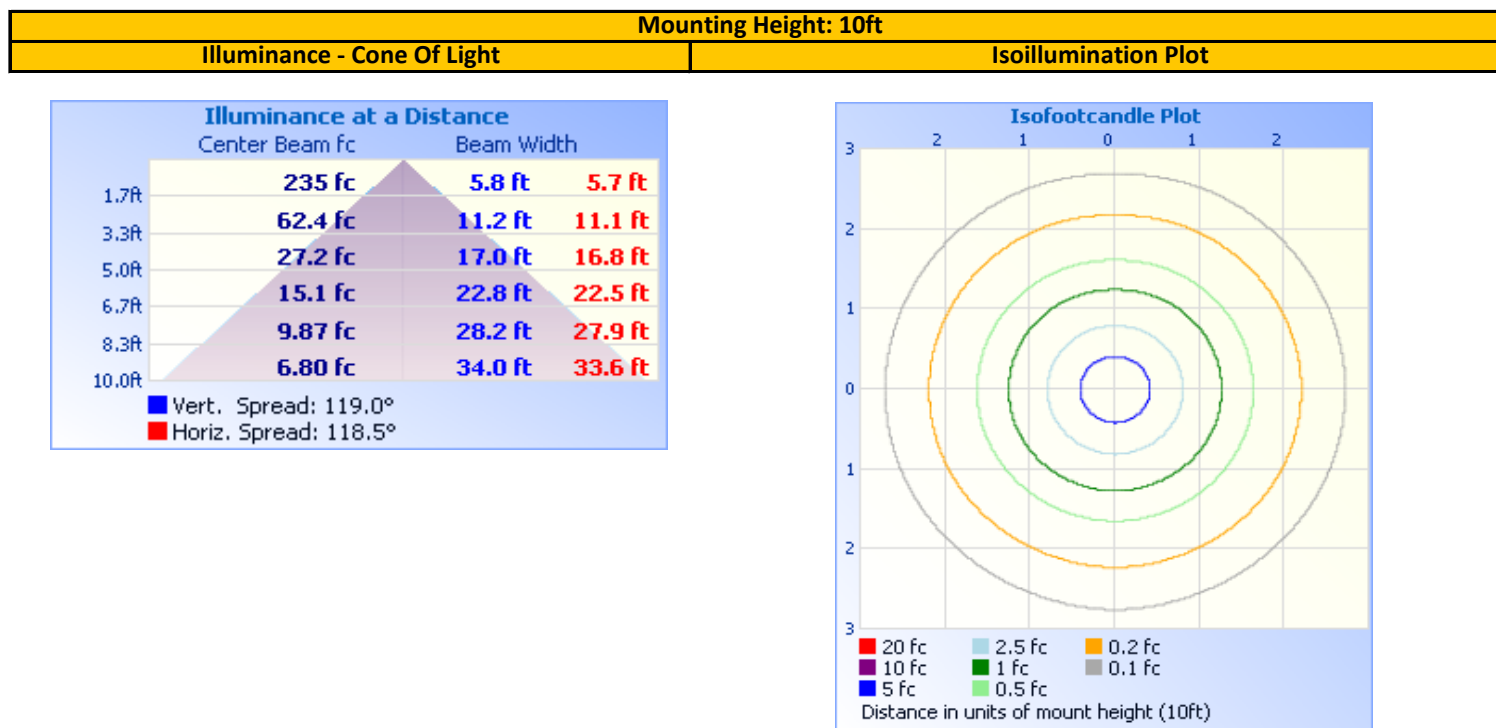
Angle	0	22.5	45	67.5	90
0	679.6	679.6	679.6	679.6	679.6
5	674.6	677.5	677.6	677.5	677.1
10	669.9	672.6	672.2	673	673.2
15	662.1	661.5	661.4	661.2	661.1
20	646.6	642.4	642.8	642.6	642.5
25	623.9	619.2	618.2	619.1	618.3
30	596.1	588.7	588.4	588.6	588.5
35	563.8	554.5	554	553.4	553.4
40	523	515.8	514.1	514	513.5
45	479.7	473.3	472.5	471.5	471.6
50	438.1	429.7	428.9	427.5	427
55	391.4	385.4	384.2	382.7	381.3
60	343.3	338.2	337.4	336.3	334.6
65	297.2	290.4	289.4	288.2	286.7
70	251.8	244	242.9	241.6	240.4
75	206.6	199.6	198.6	197.5	196.7
80	165.8	159.1	158.1	157	156.3
85	129.2	124.1	122.9	121.3	120.7
90	98.8	94.5	93.7	92.6	91.9
95	75.6	72.4	71.8	70.6	69.9
100	57.4	55.5	55.3	54.5	53.7
105	44.7	43.2	42.9	42.2	41.7
110	35.6	33.9	33.7	33.2	32.8
115	27.4	26	25.9	25.6	25.3
120	20.9	19.8	19.6	19.4	19.3
125	15.3	14.6	14.5	14.4	14.3
130	11.1	10.6	10.6	10.4	10.4
135	8.1	7.6	7.6	7.5	7.4
140	5.4	5.2	5.2	5.2	5.2
145	3.7	3.4	3.5	3.5	3.5
150	2.3	2.2	2.2	2.3	2.3
155	1.5	1.5	1.5	1.6	1.6
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					
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Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	536.0	22.4%	0-10	64.5	2.7%
0-40	882.3	36.9%	10-20	186.6	7.8%
0-60	1,588.6	66.5%	20-30	284.9	11.9%
60-90	628.6	26.3%	30-40	346.2	14.5%
70-100	422.0	17.7%	40-50	364.1	15.2%
90-120	150.1	6.3%	50-60	342.2	14.3%
0-90	2,217.2	92.8%	60-70	285.3	11.9%
90-180	172.0	7.2%	70-80	209.3	8.8%
0-180	2,389.3	100.0%	80-90	134.1	5.6%
			90-100	78.6	3.3%
			100-110	45.6	1.9%
			110-120	25.9	1.1%
			120-130	13.2	0.6%
			130-140	6.0	0.2%
			140-150	2.3	0.1%
			150-160	0.6	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	700FMMGN13BR-LED930	NA

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

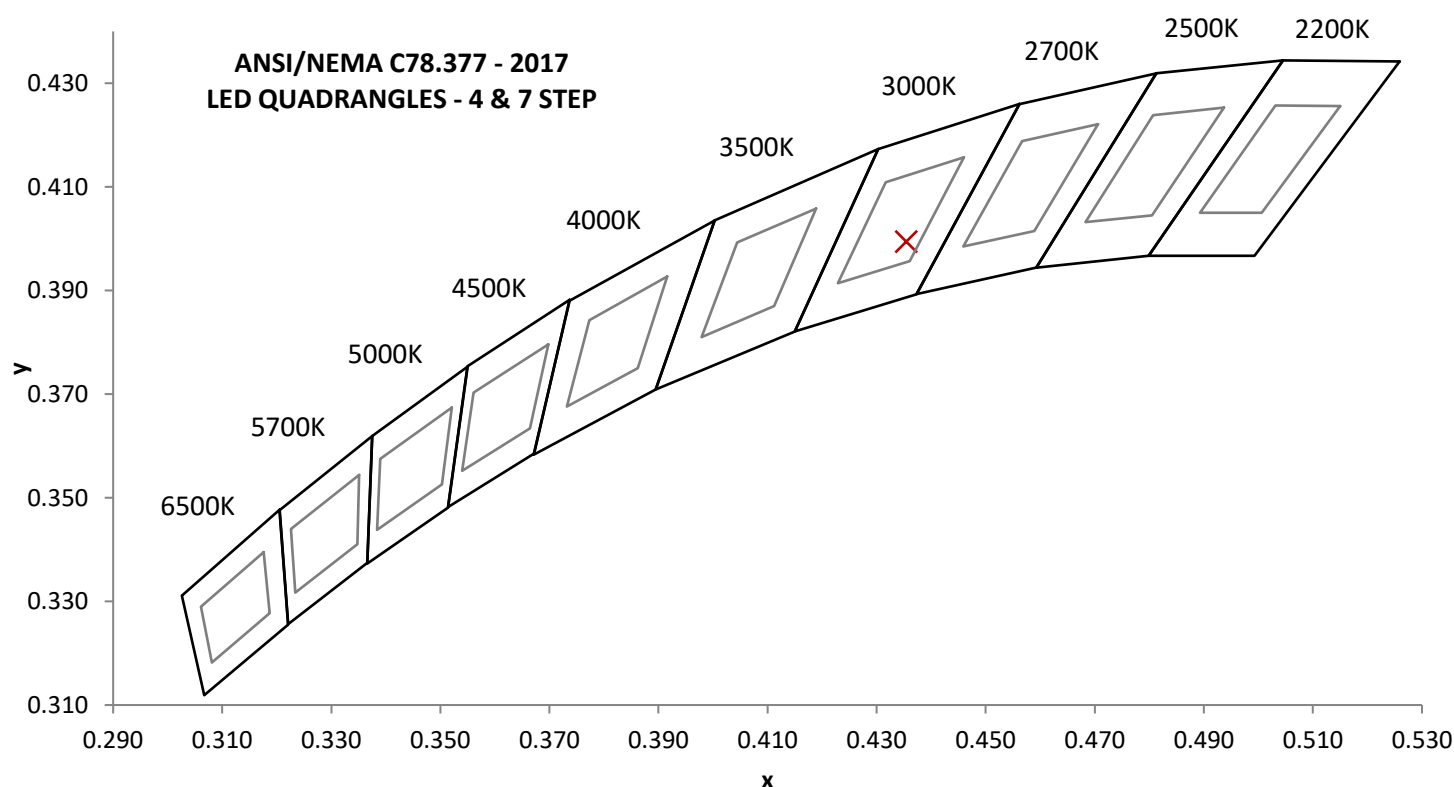
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
120.00	377.9	42.49	0.937	36.94

Measured at 120(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
2455.3	57.8	2986	92.2	57.3

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0017	0.435	0.399	0.252	0.519

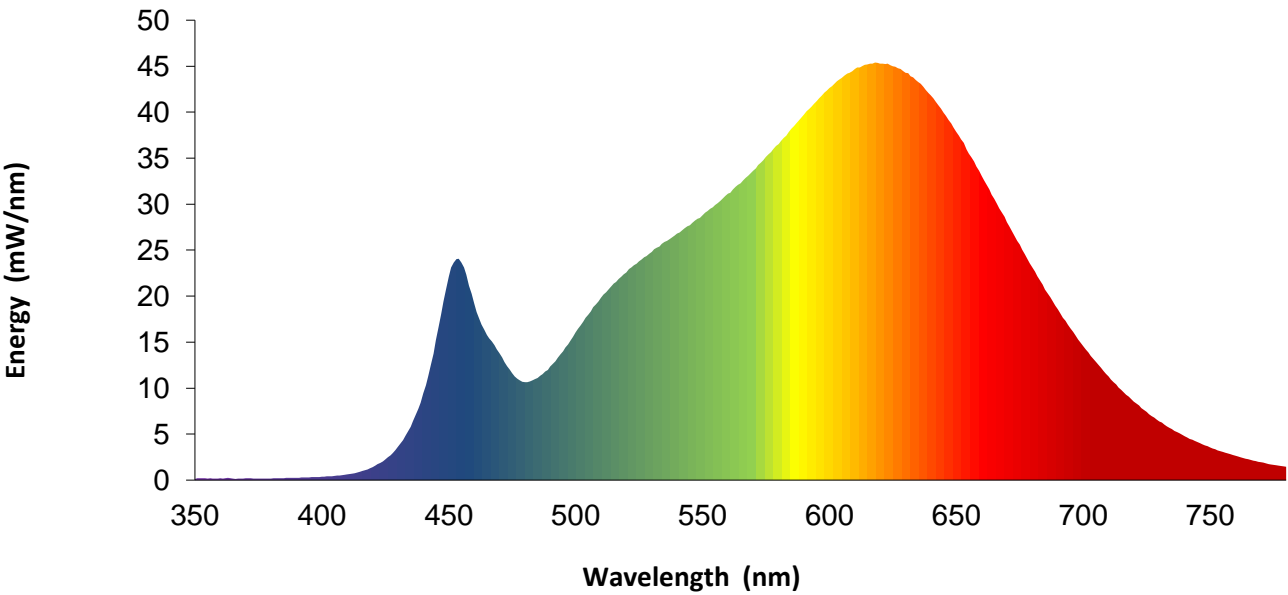


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	19.3		570	33.6		680	23.1
355	0.2		465	15.8		575	35.1		685	20.7
360	0.2		470	13.8		580	36.5		690	18.5
365	0.2		475	11.6		585	38.2		695	16.5
370	0.2		480	10.6		590	39.7		700	14.6
375	0.2		485	11.1		595	41.2		705	12.8
380	0.2		490	12.3		600	42.6		710	11.3
385	0.2		495	14.0		605	43.8		715	9.8
390	0.3		500	16.1		610	44.7		720	8.6
395	0.3		505	18.0		615	45.2		725	7.4
400	0.4		510	19.8		620	45.3		730	6.4
405	0.5		515	21.4		625	45.0		735	5.5
410	0.6		520	22.6		630	44.3		740	4.8
415	0.9		525	23.8		635	43.3		745	4.1
420	1.4		530	24.8		640	41.8		750	3.6
425	2.2		535	25.9		645	39.9		755	3.1
430	3.6		540	26.8		650	37.9		760	2.7
435	5.8		545	27.7		655	35.5		765	2.3
440	9.4		550	28.8		660	33.0		770	2.0
445	15.2		555	29.9		665	30.6		775	1.7
450	22.1		560	31.1		670	28.1		780	1.4
455	23.6		565	32.3		675	25.6		---	---

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

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Yokogawa Power Meter	WT210	146919	7/1/2021	7/1/2022
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	146379	4/13/2021	4/13/2022
5	Chroma Power Supply	61604	CHI0371	VBU	VBU
8	Newport Humidity Recorder	iServer	CHI0451	1/29/2021	1/29/2022
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	4/8/2021	4/8/2022
17	Omega thermometer	USB TC08	EQAH002615	4/6/2021	4/6/2022
26	Xitron Power Analyzer	XT-2640	CHI0611	6/9/2021	6/9/2022
27					
28					
29					
30					

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

REVISION HISTORY

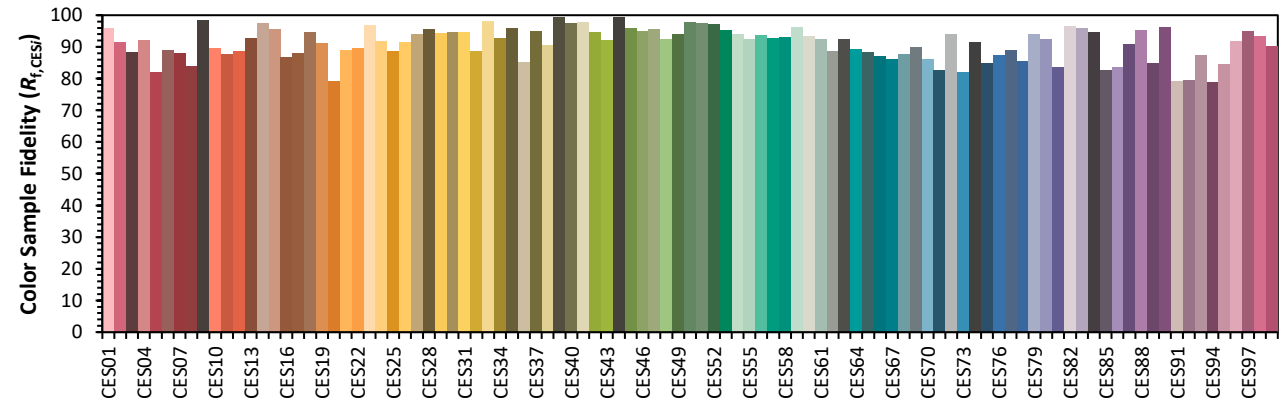
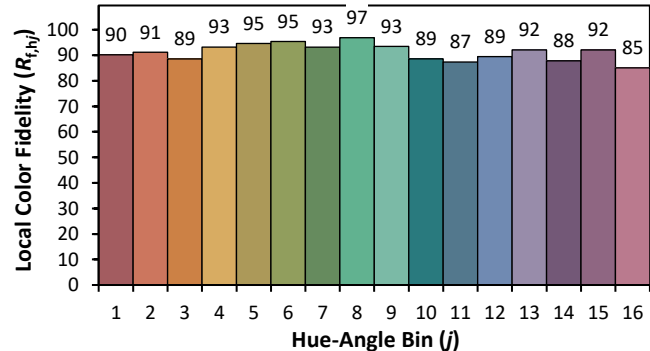
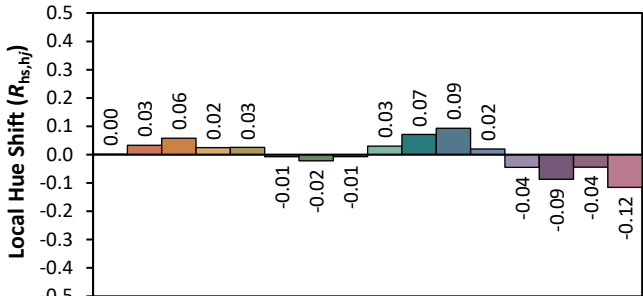
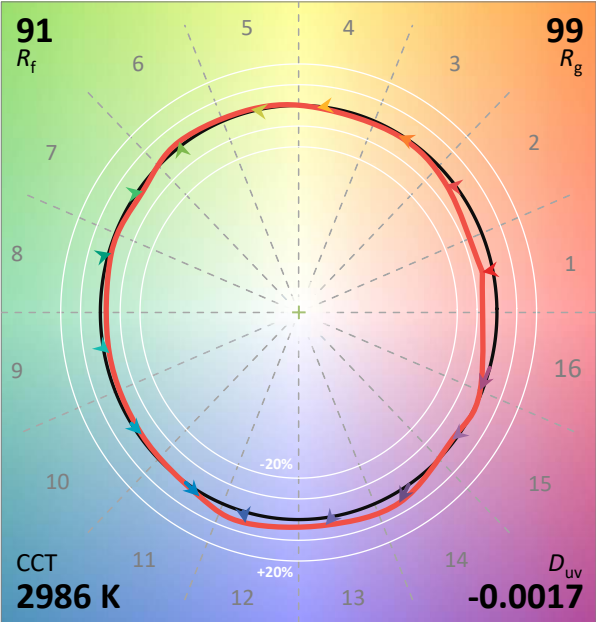
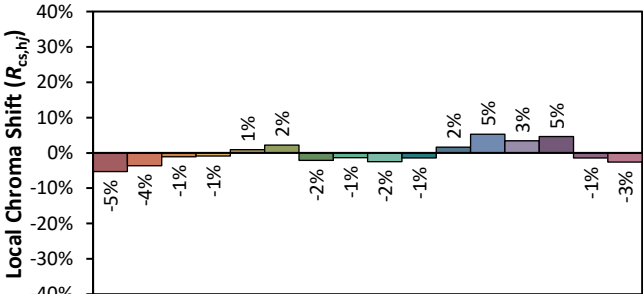
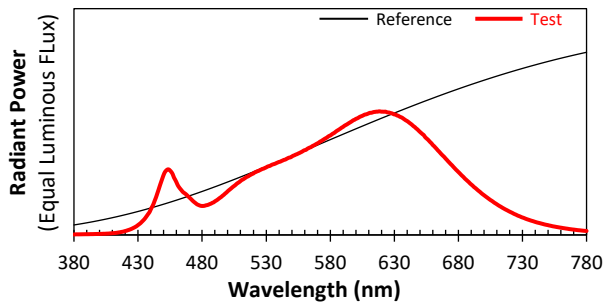
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700FMMGN13BR-LED930	NA

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD
Date: 10/15/2021

Manufacturer: VISUAL COMFORT AND COMPANY
Model: 700FMMGN13BR-LED930



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

x 0.4355
y 0.3994
u' 0.2517
v' 0.5193