

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCMLN13WNB-LED930

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CHI-009

ISSUE DATE

10/25/2021

REVISED DATE

None

TEST DATES

10/18/2021 through 10/25/2021.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104659241CHI-009

MODEL NUMBER(s)

700BCMLN13WNB-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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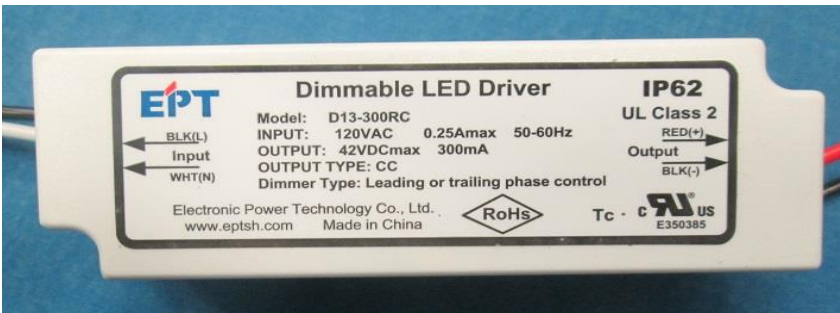
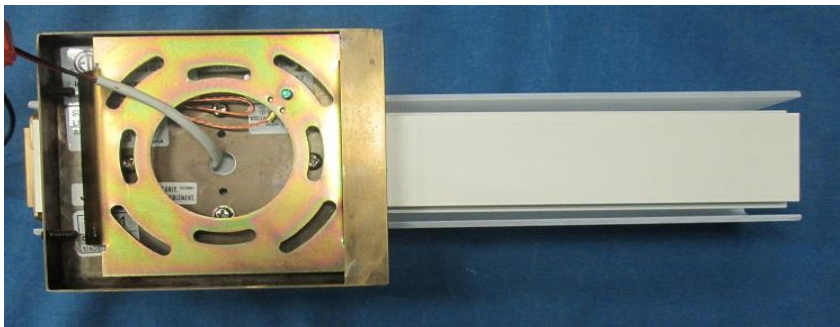
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH10142021015751-004	700BCMLN13WNB-LED930	Milan 13 Bath	Production	10/14/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700BCMLN13WNB-LED930	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCMLN13WNB-LED930
Product Description:	Milan 13 Bath
LED Model No.:	Everlight/62-217D/HK4C-H3030QA1R32835Z15/2T
Driver Model No.:	EPT/D13-300RC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	879.3	905.8
Input Power (W) @ 120VAC (Vac)	13.03	13.01
Lumen Efficacy (lm/W)	67.5	69.6
Input Power Factor (I) @ 120VAC (Vac)	0.991	0.991

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	8.44
Correlated Color Temperature (K)	2990
Color Rendering Index - Ra (I)	92.2
Color Rendering Index - R9 (I)	52.6
Duv (I)	0.0026
Chromaticity Coordinate (x)	0.441
Chromaticity Coordinate (y)	0.412
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.525

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	700BCMLN13WNB-LED930	NA

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

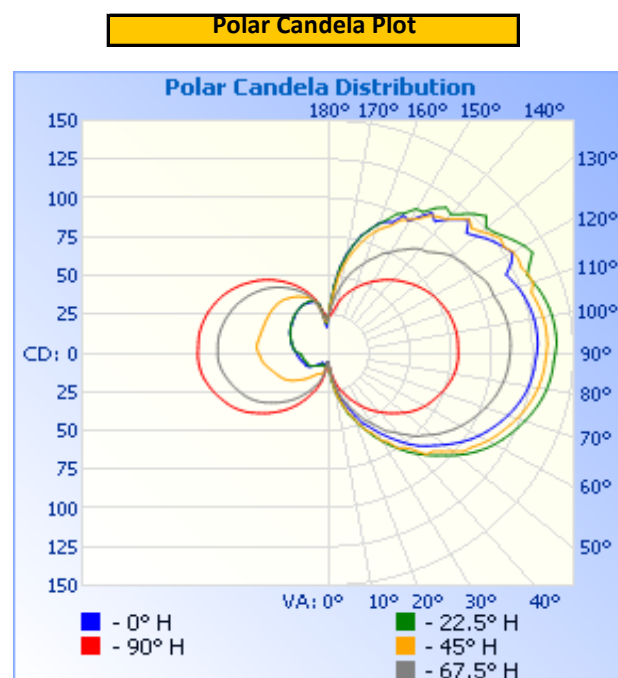
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Horizontal	119.96	109.6	13.03	0.991

Light Output (lm)	Lumen Efficacy (lm/W)
879.3	67.5

INTENSITY SUMMARY - CANDELA

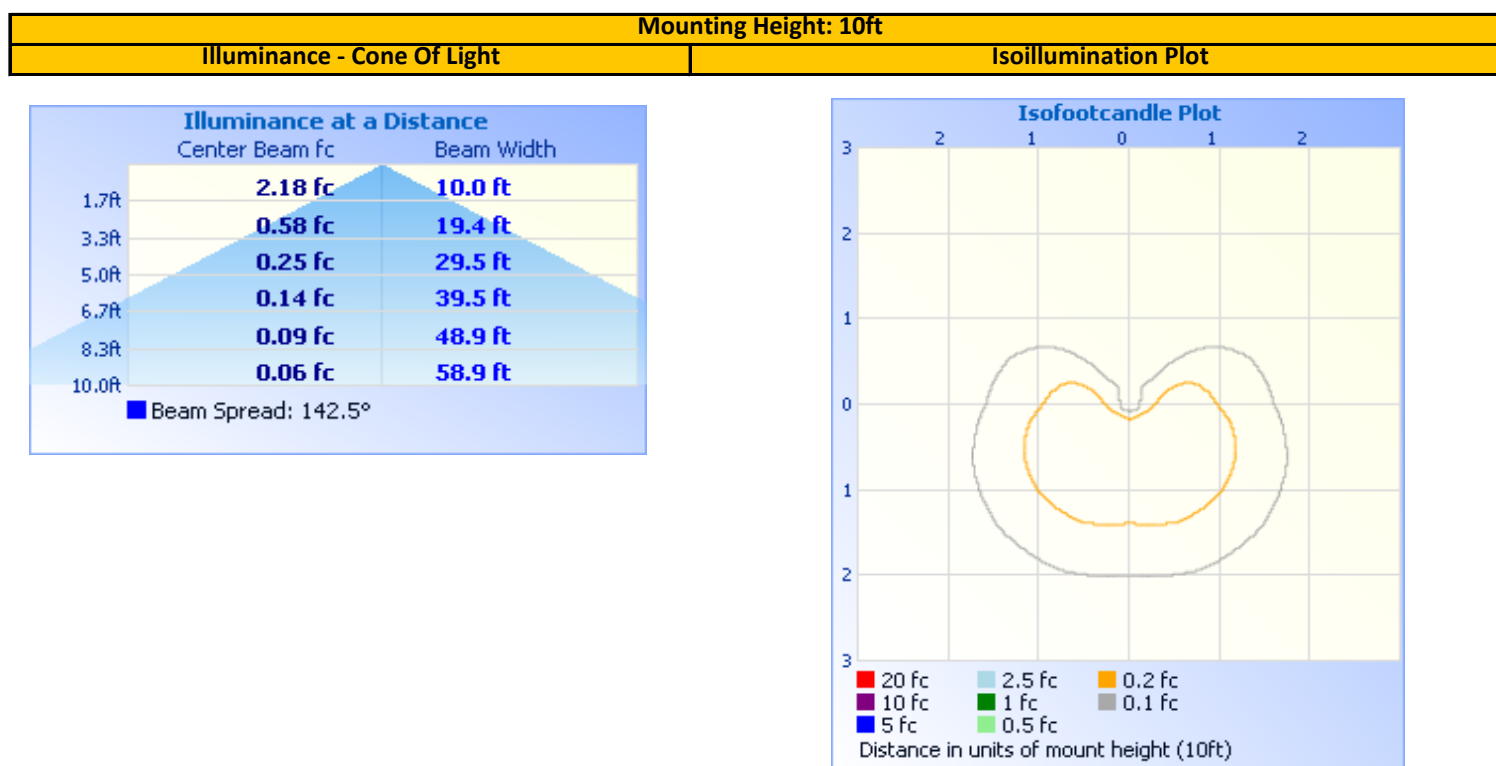
Angle	0	22.5	45	67.5	90
0	6.3	6.3	6.3	6.3	6.3
5	10.1	11.9	11	9.7	9
10	21.4	24.7	23.5	18.6	15.5
15	31.8	35	34.4	27.7	21.9
20	38.9	45	44.2	35.8	27.3
25	49.9	55	54.7	44	33.1
30	57.7	65.3	65.2	52.1	38.9
35	66.9	75.5	75.3	61.5	44.5
40	76.6	84.9	81.6	67.8	49.8
45	84.6	93.6	89.9	76.2	54.9
50	92.1	102.5	98.4	82	59.9
55	99.8	110.7	106.3	88.4	64.6
60	106.5	117.6	112.9	93.9	68.4
65	112.1	123	118.1	98.4	71.2
70	117.1	128	123	102.5	74
75	121.2	132.3	127.1	106	76.3
80	124.4	135.5	130.3	108.6	78.2
85	126.2	137.4	132.2	110.3	79.2
90	127.5	138.8	133.3	111.2	79.5
95	128.2	139.7	134	111.7	79.5
100	127.7	138.9	133.3	111.2	79.5
105	126.1	136.8	131.4	109.9	78.8
110	123.5	133.4	133.2	107.7	77.7
115	120	135.7	130.3	107.2	76.1
120	130	138.4	130.4	103.5	74.2
125	124.6	131.4	128.7	101.3	71.6
130	117.7	126	122	98.1	68.6
135	121.5	126.8	121.9	91.8	65.2
140	112.5	116.7	112.7	87.7	61.6
145	110.4	114.1	108.4	81.5	57.5
150	98.3	107.5	99.4	74.7	53.1
155	93.1	98.9	90.8	67.9	48.5
160	88.7	88.2	83.3	60.7	43.6
165	78.5	78	71.9	53.2	38.4
170	64.4	63.5	58.8	43.9	31.7
175	44	43.9	39.3	32.5	25.7
180	23.1	23.1	23.1	23.1	23.1

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	23.2	2.6%	90-100	91.3	10.4%
0-40	51.3	5.8%	100-110	87.8	10.0%
0-60	153.3	17.4%	110-120	81.6	9.3%
60-90	244.5	27.8%	120-130	71.9	8.2%
70-100	263.6	30.0%	130-140	58.8	6.7%
90-120	260.8	29.7%	140-150	43.8	5.0%
0-90	397.8	45.2%	150-160	28.5	3.2%
90-180	481.5	54.8%	160-170	14.4	1.6%
0-180	879.3	100.0%	170-180	3.3	0.4%

INTEGRATING SPHERE TESTING

REPORT NO. 104659241CHI-009

Test Configuration	Tested Model No.	Pass/Fail/NA
1	700BCMLN13WNB-LED930	NA

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

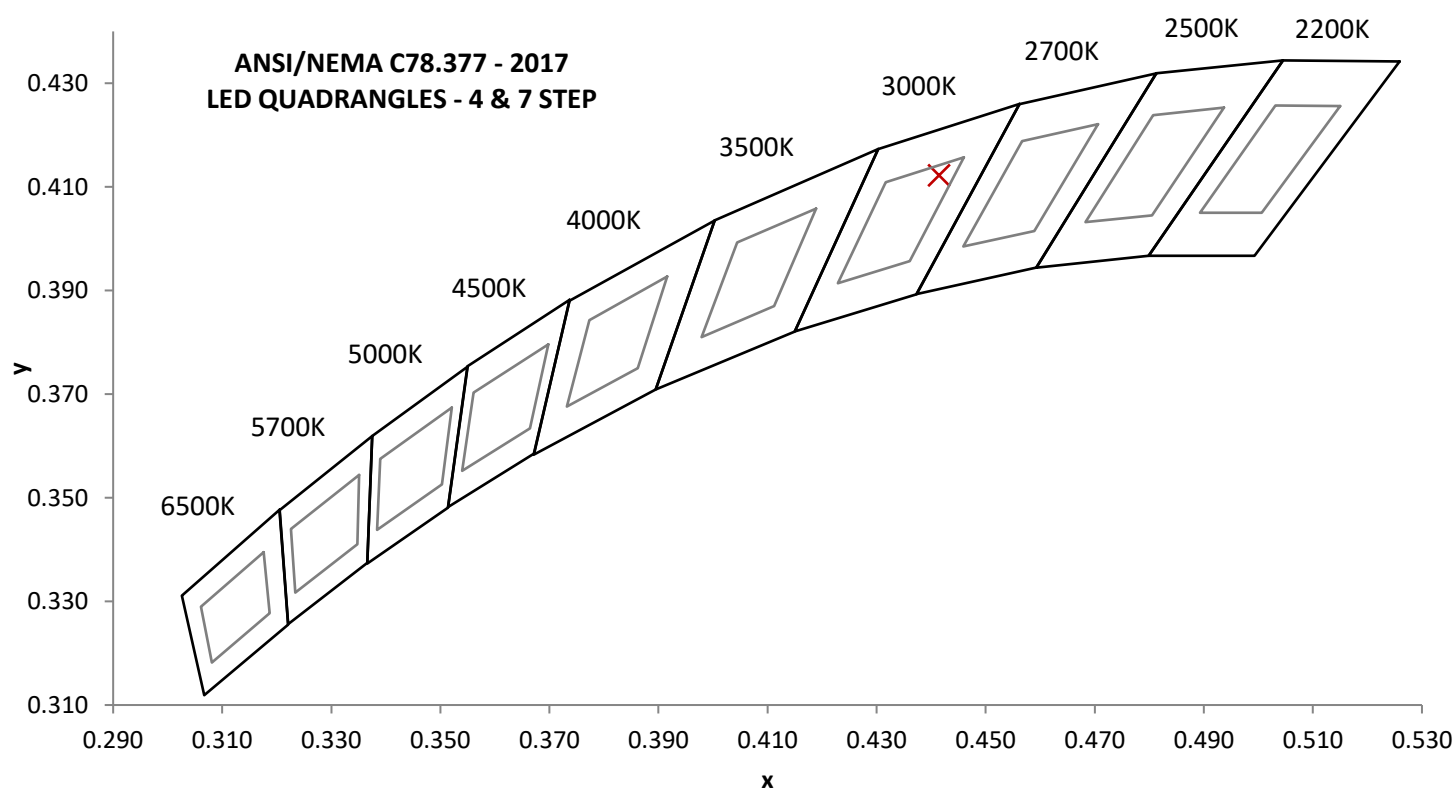
Base Orientation
Horizontal

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
119.98	109.4	13.01	0.991	8.44

Measured at 119.98(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
905.8	69.6	2990	92.2	52.6

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0026	0.441	0.412	0.250	0.525

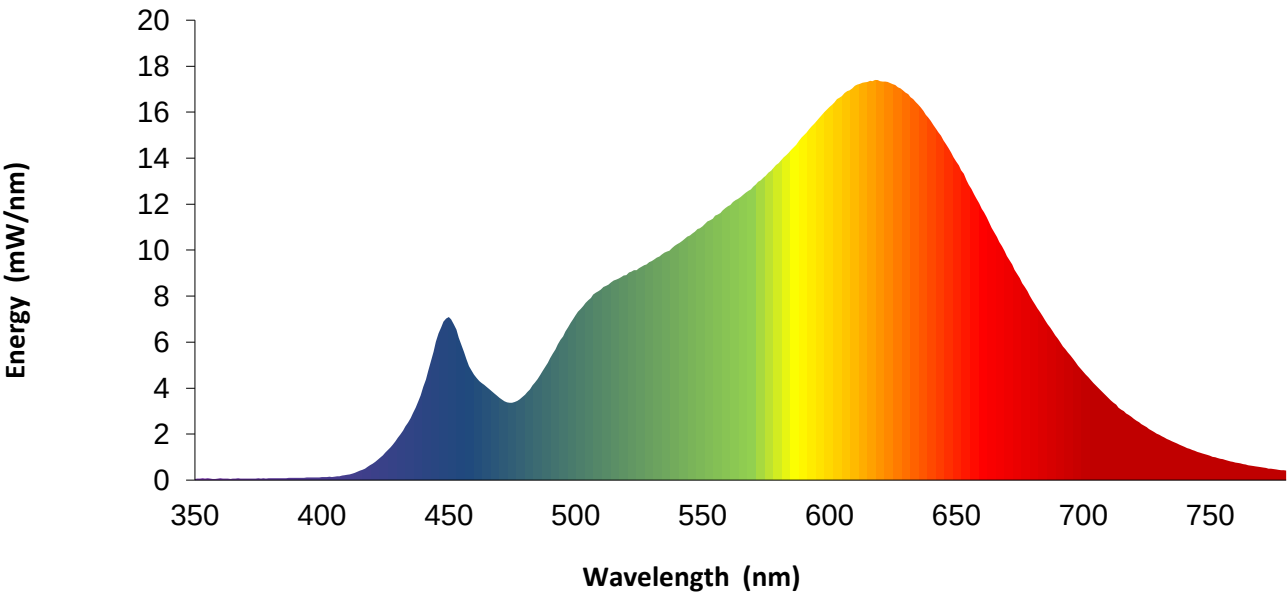


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	4.6		570	12.8		680	7.8
355	0.1		465	4.0		575	13.2		685	7.0
360	0.1		470	3.6		580	13.8		690	6.1
365	0.1		475	3.4		585	14.4		695	5.4
370	0.1		480	3.7		590	15.0		700	4.7
375	0.1		485	4.4		595	15.6		705	4.1
380	0.1		490	5.3		600	16.2		710	3.6
385	0.1		495	6.3		605	16.7		715	3.1
390	0.1		500	7.2		610	17.1		720	2.7
395	0.1		505	7.8		615	17.3		725	2.3
400	0.1		510	8.3		620	17.3		730	2.0
405	0.2		515	8.7		625	17.2		735	1.7
410	0.2		520	8.9		630	16.8		740	1.4
415	0.4		525	9.2		635	16.3		745	1.2
420	0.7		530	9.5		640	15.6		750	1.1
425	1.2		535	9.9		645	14.8		755	0.9
430	1.8		540	10.3		650	13.9		760	0.8
435	2.7		545	10.6		655	12.8		765	0.7
440	4.1		550	11.0		660	11.8		770	0.6
445	6.0		555	11.5		665	10.8		775	0.5
450	7.1		560	11.9		670	9.7		780	0.4
455	5.9		565	12.3		675	8.8		---	---

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	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

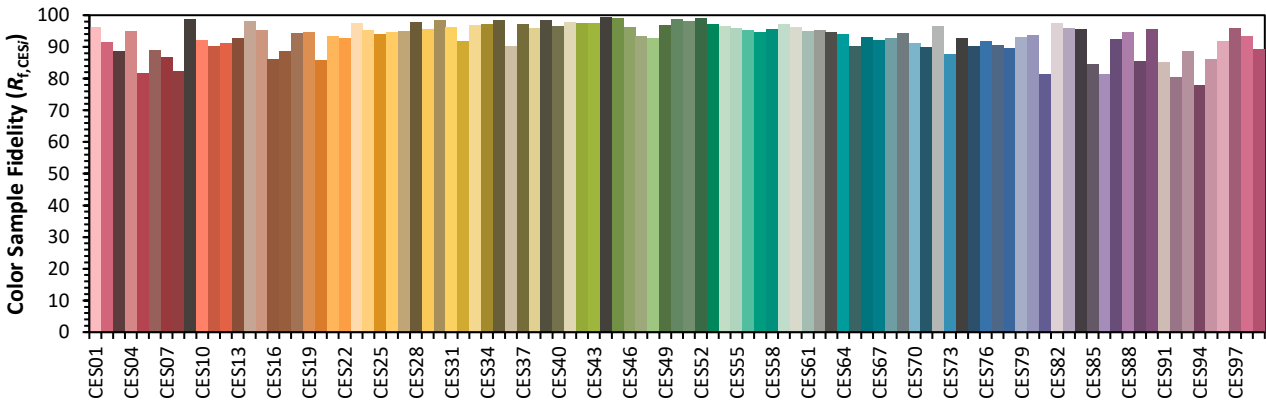
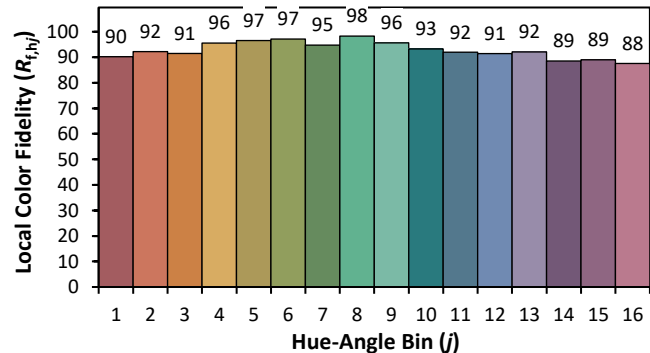
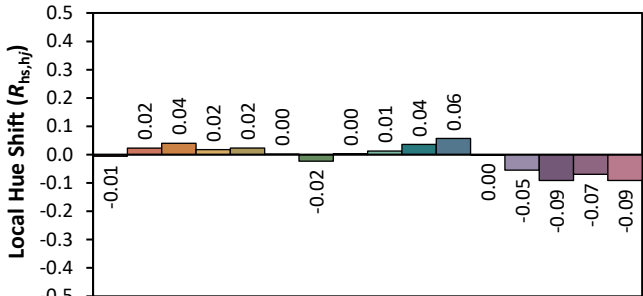
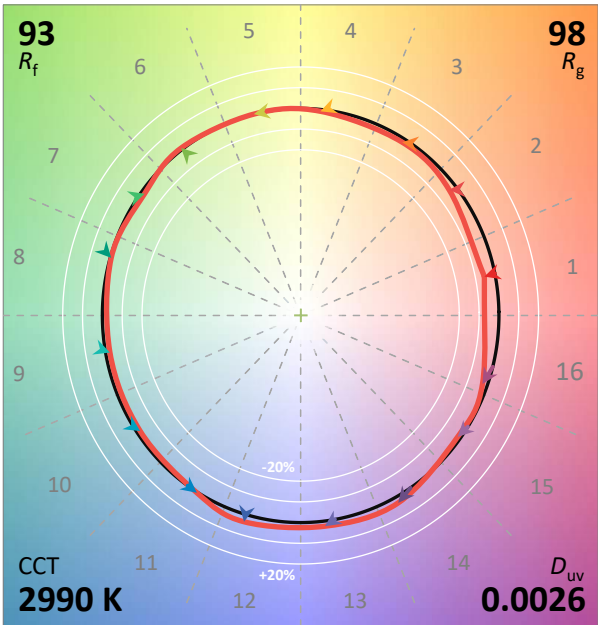
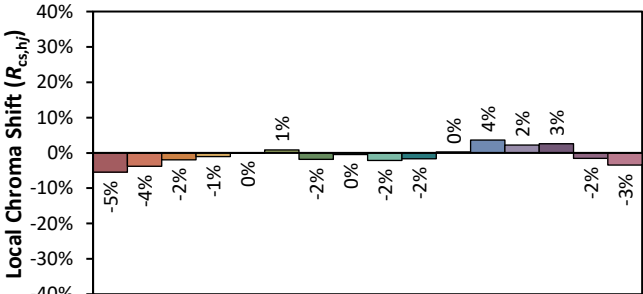
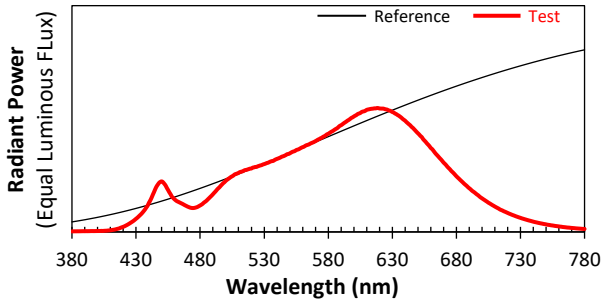
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700BCMLN13WNB-LED930	NA

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD
Date: 10/18/2021

Manufacturer: VISUAL COMFORT AND COMPANY
Model: 700BCMLN13WNB-LED930



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

x 0.4415
 y 0.4122
 u' 0.2500
 v' 0.5252