

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700TDOBT13NB-LED927

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CHI-019

ISSUE DATE

11/17/2021

REVISED DATE

None

TEST DATES

10/28/2021 through 11/04/2021.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104659241CHI-019

MODEL NUMBER(s)

700TDOB13NB-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-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:



Tim Quigley
Position
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Reviewer:



Jeff Davis
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SAMPLE INFORMATION

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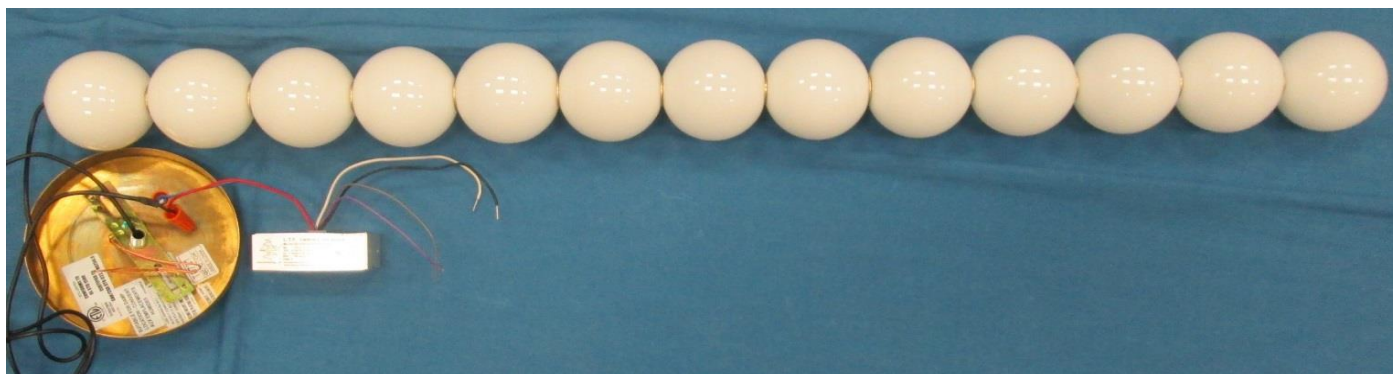
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH10282021072848-001	700TDOBT13NB-LED927	Orbet 13-Light Pendant	Production	10/28/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700TDOBT13NB-LED927	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700TDOB13NB-LED927
Product Description:	Orbet 13-Light Pendant
LED Model No.:	GL-24-F447N-A
Driver Model No.:	DS25W24VBF1UD-0000
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1185.5	1211.4
Input Power (W) @ 120VAC (Vac)	19.63	19.60
Lumen Efficacy (lm/W)	60.4	61.8
Input Power Factor (PF) @ 120VAC (Vac)	0.959	0.965

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	14.28
Correlated Color Temperature (K)	2661
Color Rendering Index - Ra	93.2
Color Rendering Index - R9	61.7
Duv	-0.0010
Chromaticity Coordinate (x)	0.461
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.265
Chromaticity Coordinate (v')	0.527

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	700TDOB13NB-LED927	NA

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

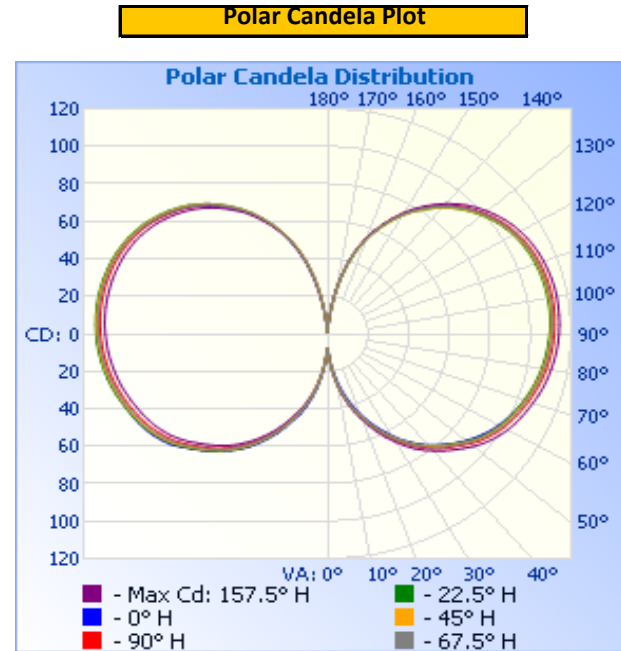
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)
Vertical	120.01	170.6	19.63	0.959

Light Output (lm)	Lumen Efficacy (lm/W)
1185.5	60.4

INTENSITY SUMMARY - CANDELA

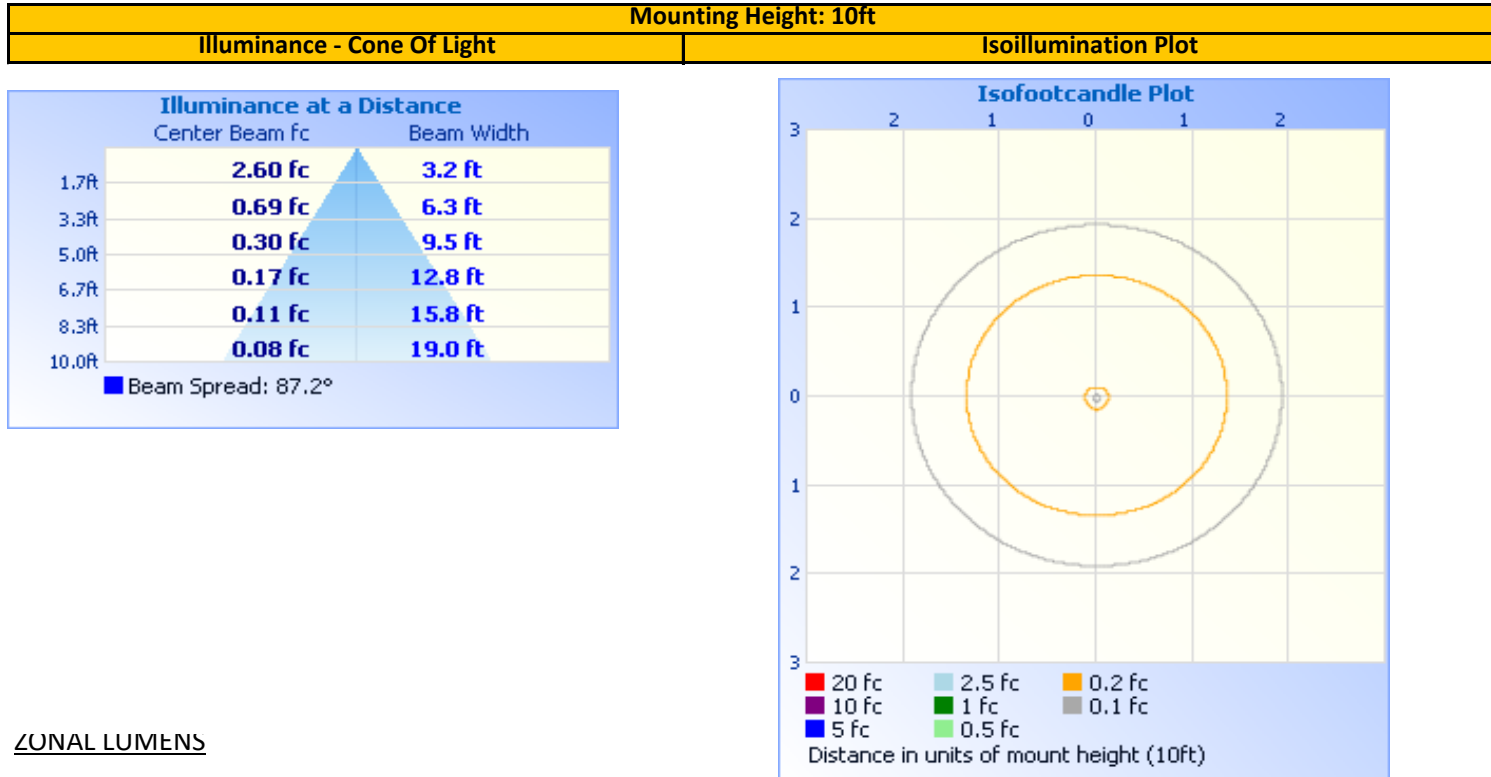
Angle	0	22.5	45	67.5	90
0	8	8	8	8	8
5	14	16	16	16	16
10	25	27	27	27	27
15	35	37	37	37	38
20	44	46	46	46	47
25	54	55	55	56	56
30	62	63	64	64	65
35	70	71	71	72	73
40	78	78	78	79	80
45	83	84	84	85	86
50	89	89	90	90	91
55	94	94	95	95	96
60	97	98	98	99	100
65	101	101	101	102	103
70	103	103	104	104	105
75	106	105	106	107	108
80	108	107	108	108	109
85	109	108	109	110	111
90	110	109	110	111	112
95	110	110	111	111	112
100	111	110	111	112	112
105	110	110	110	111	112
110	110	109	110	110	111
115	108	108	108	109	110
120	106	106	106	107	108
125	104	103	103	104	104
130	100	99	99	100	100
135	95	94	94	95	96
140	89	88	88	89	89
145	82	81	81	82	82
150	74	73	73	73	74
155	64	63	63	64	64
160	53	52	53	53	53
165	40	38	39	39	40
170	23	22	23	23	23
175	6	5	6	6	6
180	1	1	1	1	1

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	39.0	3.3%	0-10	1.9	0.2%
0-40	84.8	7.2%	10-20	10.9	0.9%
0-60	237.5	20.0%	20-30	26.2	2.2%
60-90	336.7	28.4%	30-40	45.8	3.9%
70-100	356.9	30.1%	40-50	66.4	5.6%
90-120	349.7	29.5%	50-60	86.4	7.3%
0-90	574.3	48.4%	60-70	102.2	8.6%
90-180	611.3	51.6%	70-80	113.8	9.6%
0-180	1,185.5	100.0%	80-90	120.8	10.2%
			90-100	122.4	10.3%
			100-110	118.4	10.0%
			110-120	108.9	9.2%
			120-130	93.6	7.9%
			130-140	73.9	6.2%
			140-150	51.6	4.4%
			150-160	29.8	2.5%
			160-170	11.5	1.0%
			170-180	1.2	0.1%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDOBT13NB-LED927	NA

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

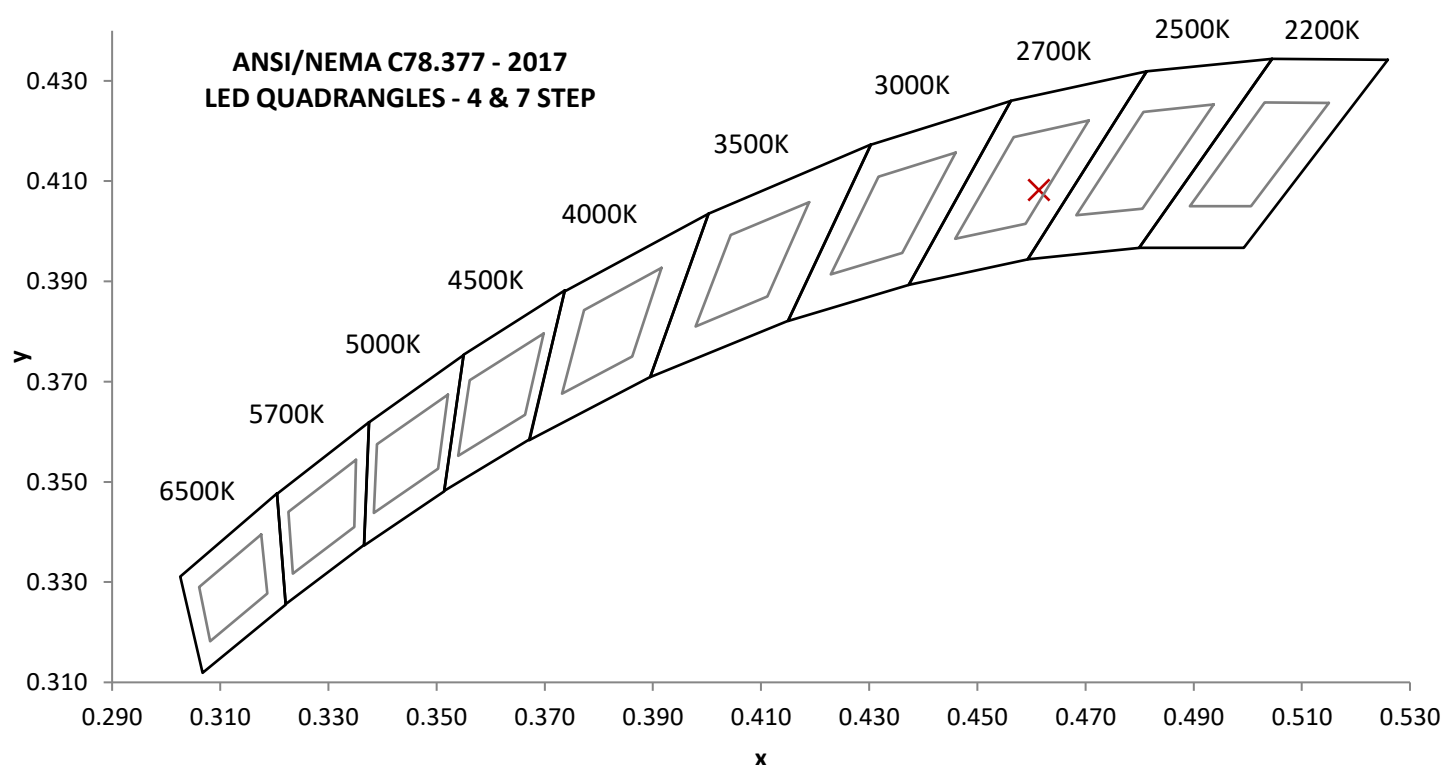
Base Orientation
Vertical

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
119.99	169.4	19.60	0.965	14.28

Measured at 119.99(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
1211.4	61.8	2661	93.2	61.7

Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0010	0.461	0.408	0.265	0.527

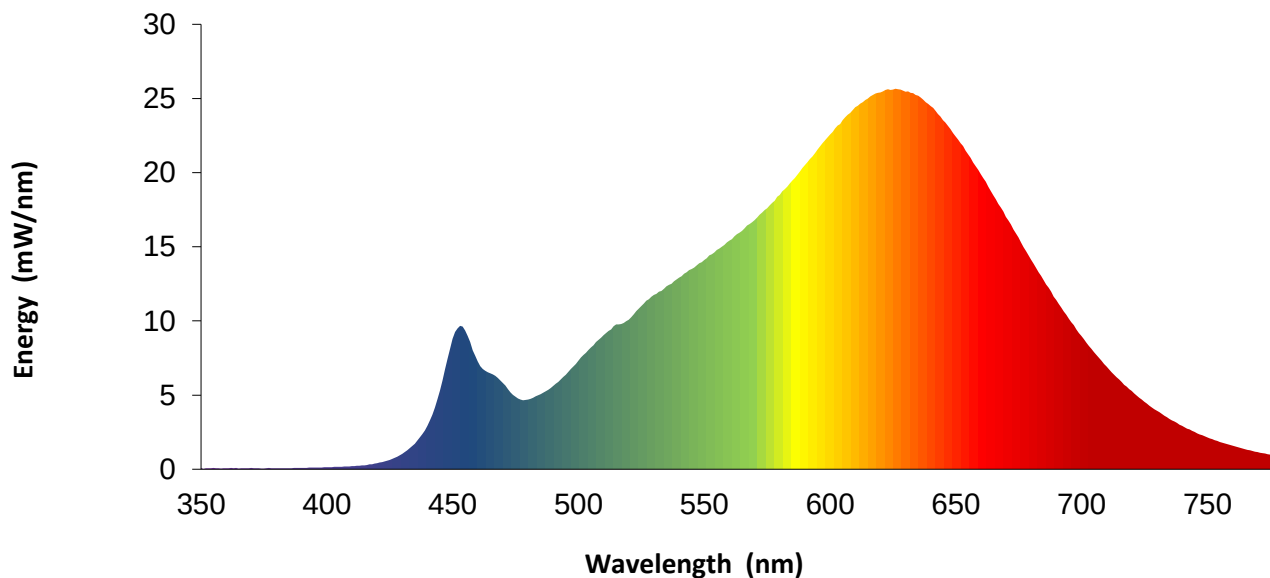


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.1		460	7.3		570	16.8		680	14.1
355	0.1		465	6.5		575	17.6		685	12.8
360	0.1		470	5.8		580	18.5		690	11.4
365	0.1		475	4.9		585	19.5		695	10.2
370	0.1		480	4.7		590	20.5		700	9.0
375	0.1		485	5.1		595	21.6		705	7.9
380	0.1		490	5.6		600	22.6		710	6.9
385	0.1		495	6.4		605	23.5		715	6.0
390	0.1		500	7.3		610	24.4		720	5.3
395	0.1		505	8.2		615	25.0		725	4.6
400	0.1		510	9.0		620	25.4		730	3.9
405	0.2		515	9.8		625	25.6		735	3.4
410	0.2		520	10.1		630	25.5		740	2.9
415	0.3		525	11.0		635	25.2		745	2.5
420	0.4		530	11.8		640	24.5		750	2.2
425	0.6		535	12.3		645	23.5		755	1.8
430	1.0		540	12.9		650	22.4		760	1.6
435	1.7		545	13.5		655	21.2		765	1.4
440	2.9		550	14.1		660	19.9		770	1.2
445	5.3		555	14.8		665	18.5		775	1.0
450	8.8		560	15.4		670	17.0		780	0.8
455	9.4		565	16.1		675	15.6		---	---

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	VBV	VBV
4	Newport Thermohygrometer	iServer	146379	4/13/2021	4/13/2022
5	Chroma Power Supply	61604	CHI0371	VBV	VBV
8	Newport Humidity Recorder	iServer	146961	9/21/2021	9/21/2022
9	Labsphere Spectroradiometer	CDS2600	CHI0539	VBV	VBV
10	3 Meter Sphere	SPR600	CHI0088	VBV	VBV
11	Elgar AC Power Supply	CW1251	146112	VBV	VBV
12	Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV
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

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDOBT13NB-LED927	NA

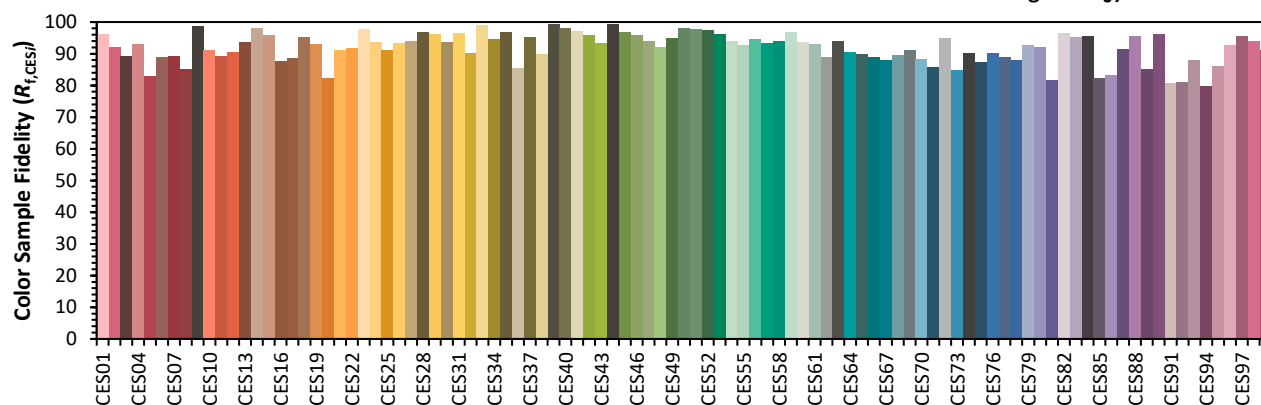
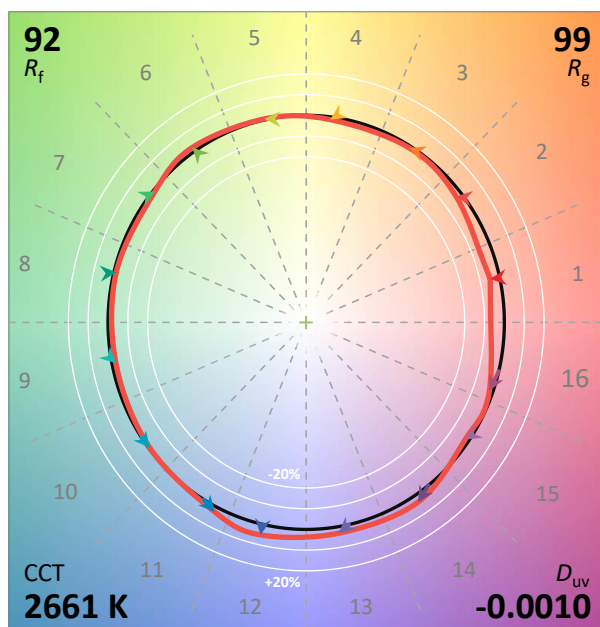
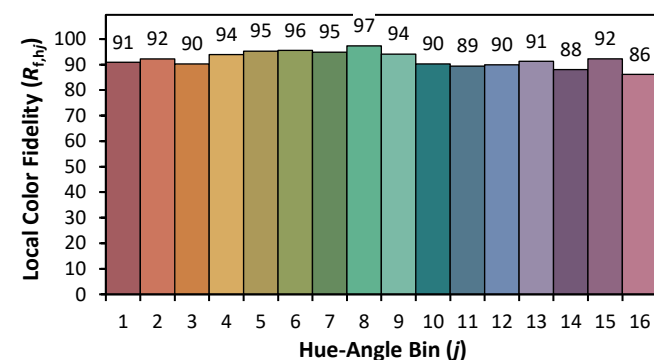
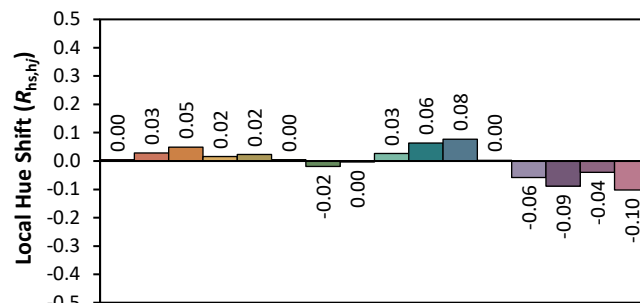
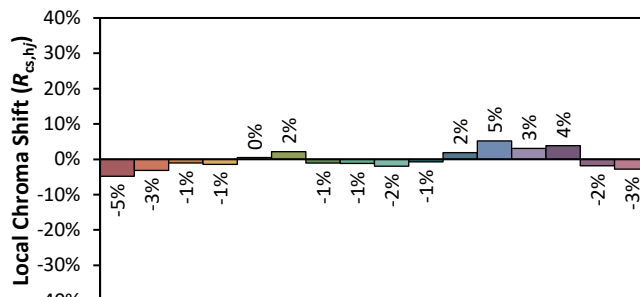
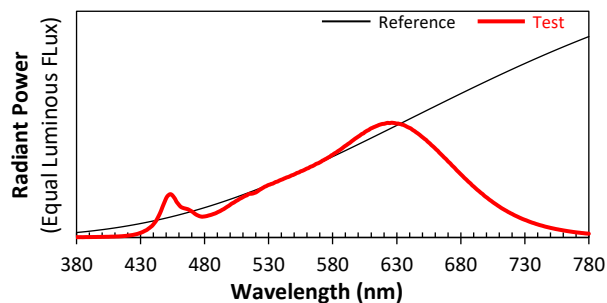
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 10/28/2021

Model: 700TDOBT13NB-LED927



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

x 0.4614

y 0.4082

u' 0.2645

v' 0.5267