

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700TDOBT5NB-LED927

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CHI-021

ISSUE DATE

4/19/2022

REVISED DATE

None

TEST DATES

2022-04-19.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CHI-021

MODEL NUMBER(s)

700TDOBT5NB-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:



Maximilian Carvajal
Engineer
Lighting Division

Reviewer:



Jeff Davis
N.A. Technical Lead
Lighting Division

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SAMPLE INFORMATION

REPORT NO. 104941221CHI-021

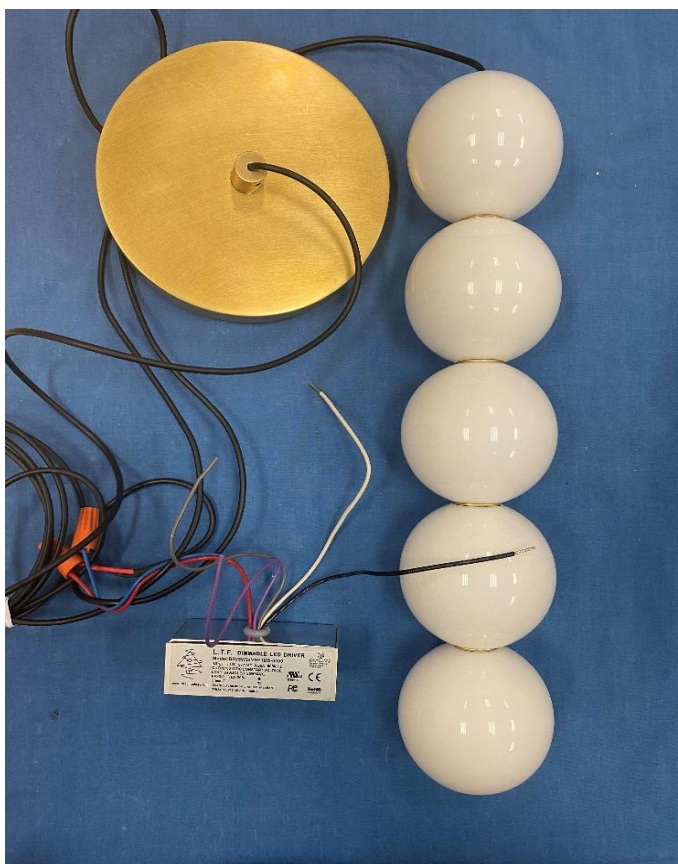
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH04122022112212	700TDOBT5NB-LED927	Orbet 5-Light Pendant	Production	4/12/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700TDOBT5NB-LED927	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700TDOB5NB-LED927
Product Description:	Orbet 5-Light Pendant
LED Model No.:	GL-24-F447N-A
Driver Model No.:	DS12W24VMB1UD-0001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	428.2	444.4
Input Power (W) @ 120VAC (Vac)	8.07	8.09
Lumen Efficacy (lm/W)	53.1	54.9
Input Power Factor (PF) @ 120VAC (Vac)	0.901	0.908

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	21.49
Correlated Color Temperature (K)	2640
Color Rendering Index - Ra (I)	93.2
Color Rendering Index - R9 (I)	61.6
Duv (I)	-0.0016
Chromaticity Coordinate (x)	0.462
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.266
Chromaticity Coordinate (v')	0.526

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

REPORT NO. 104941221CHI-021

Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDOB5NB-LED927	NA

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

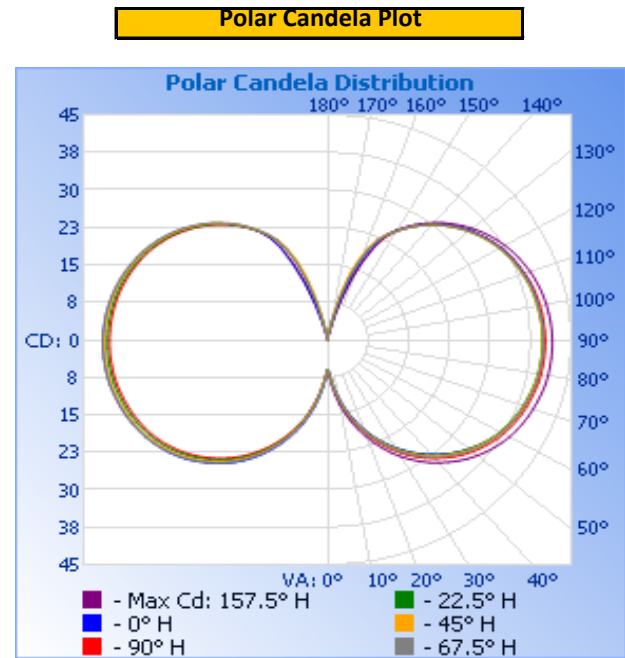
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)
Up	120.05	74.6	8.07	0.901

Light Output (lm)	Lumen Efficacy (lm/W)
428.2	53.1

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	5.9	5.9	5.9	5.9	5.9
5	8.1	8.3	8.5	8.6	8.8
10	11.7	11.9	12.0	12.3	12.5
15	15.3	15.6	15.7	16.0	16.2
20	18.7	19.0	19.1	19.3	19.7
25	22.0	22.2	22.3	22.6	22.9
30	24.9	25.1	25.3	25.6	25.9
35	27.6	27.7	27.9	28.2	28.6
40	30.0	30.1	30.3	30.6	31.0
45	32.1	32.2	32.4	32.7	33.1
50	34.0	34.0	34.2	34.5	34.9
55	35.7	35.6	35.7	36.0	36.4
60	36.9	36.8	36.9	37.2	37.6
65	37.9	37.8	37.9	38.1	38.5
70	38.6	38.5	38.6	38.8	39.1
75	39.2	39.0	39.1	39.4	39.7
80	39.6	39.4	39.5	39.7	40.0
85	39.8	39.6	39.7	39.9	40.2
90	39.9	39.7	39.7	39.9	40.2
95	39.8	39.6	39.7	39.8	40.1
100	39.6	39.4	39.4	39.6	39.8
105	39.3	39.0	39.0	39.2	39.4
110	38.6	38.4	38.4	38.5	38.8
115	37.9	37.6	37.6	37.8	38.0
120	36.9	36.7	36.7	36.8	37.0
125	35.6	35.4	35.4	35.5	35.7
130	34.1	33.9	33.9	33.9	34.1
135	32.3	32.1	32.1	32.1	32.3
140	30.3	30.0	30.0	30.1	30.1
145	28.0	27.7	27.7	27.7	27.7
150	25.2	25.1	25.1	25.0	25.0
155	21.1	22.0	22.2	21.9	20.6
160	13.7	16.5	17.4	16.3	12.7
165	5.1	8.6	10.2	8.5	4.3
170	1.3	1.3	2.0	1.2	1.3
175	0.3	0.2	0.2	0.2	0.2
180	0.1	0.1	0.1	0.1	0.1

Entire luminous intensity matrix found in .IES file

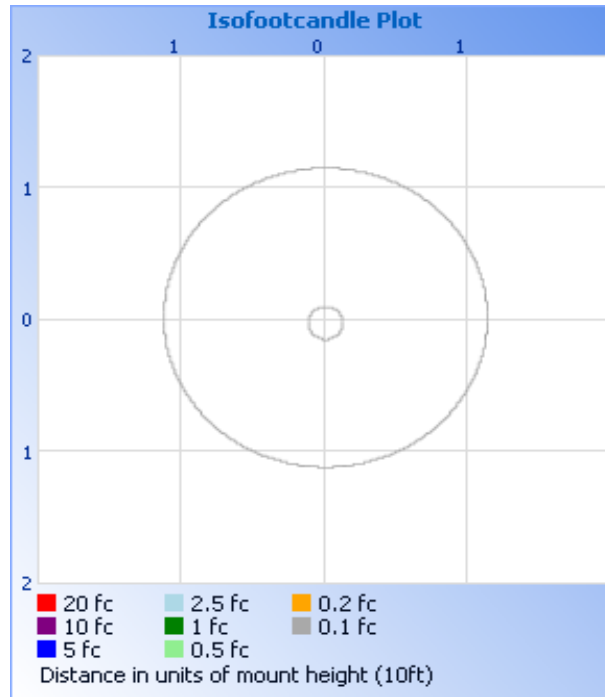


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ILLUMINANCE SUMMARY

Mounting Height: 10ft	
Illuminance - Cone Of Light	Isoillumination Plot

Illuminance at a Distance		
	Center Beam fc	Beam Width
1.7ft	2.05 fc	
3.3ft	0.54 fc	
5.0ft	0.24 fc	
6.7ft	0.13 fc	
8.3ft	0.09 fc	
10.0ft	0.06 fc	



ZONAL LUMENS

Zonal Lumen Summary					
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Zone	Lumens	Luminaire
0-30	16.4	3.8%
0-40	34.4	8.0%
0-60	92.8	21.7%
60-90	124.5	29.1%
70-100	130.2	30.4%
90-120	123.7	28.9%
0-90	217.3	50.8%
90-180	210.8	49.2%
0-180	428.2	100.0%

Zone	Lumens	Total	Zone	Lumens	Total
0-10	1.0	0.2%	90-100	44.0	10.3%
10-20	4.7	1.1%	100-110	41.9	9.8%
20-30	10.7	2.5%	110-120	37.8	8.8%
30-40	18.0	4.2%	120-130	32.1	7.5%
40-50	25.7	6.0%	130-140	25.1	5.9%
50-60	32.7	7.6%	140-150	17.5	4.1%
60-70	38.3	8.9%	150-160	9.9	2.3%
70-80	42.2	9.8%	160-170	2.5	0.6%
80-90	44.1	10.3%	170-180	0.1	0.0%

INTEGRATING SPHERE TESTING

REPORT NO. 104941221CHI-021

Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDOBT5NB-LED927	NA

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

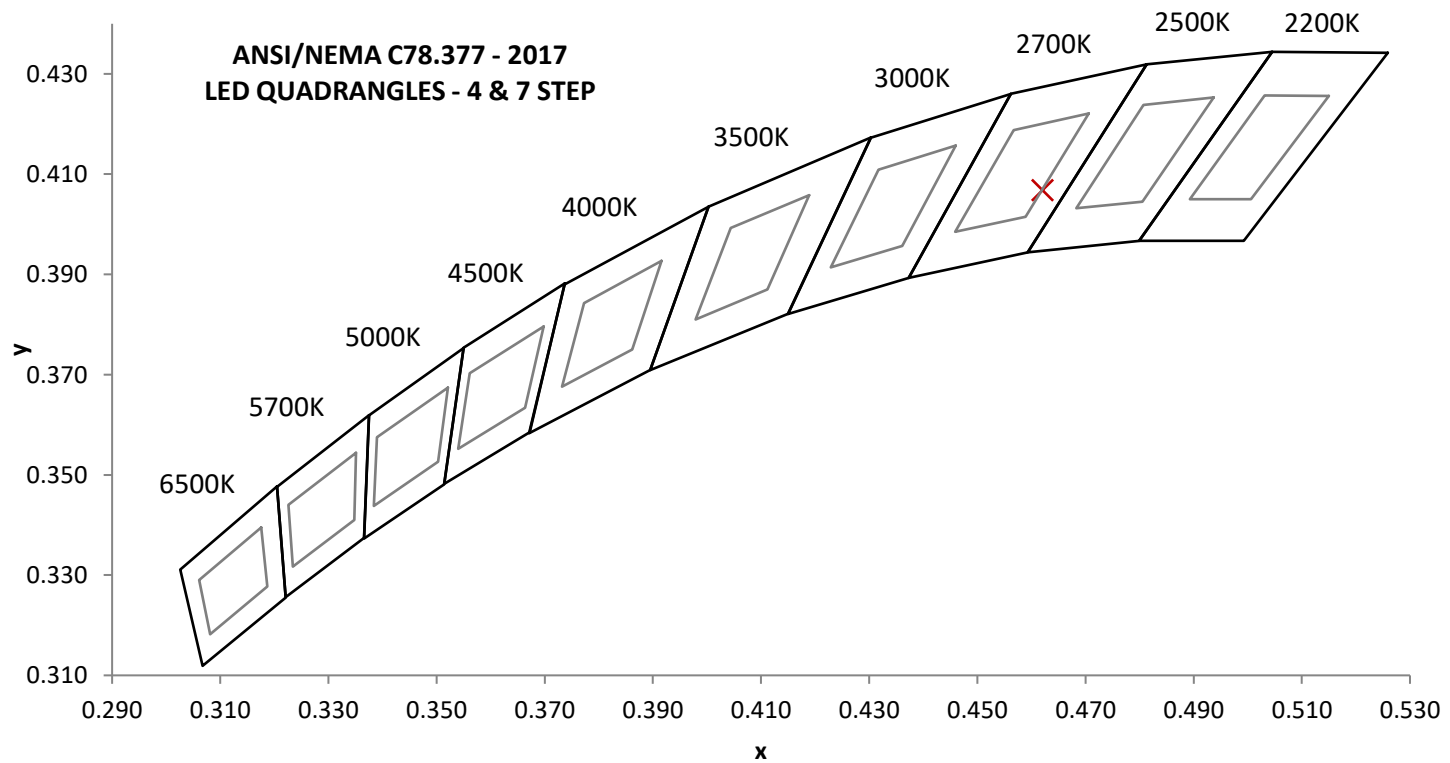
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
120.07	74.2	8.09	0.908	21.49
277.00	48.3	9.14	0.683	18.89

Measured at 120.07(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
444.4	54.9	2640	93.2	61.6

Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0016	0.462	0.407	0.266	0.526

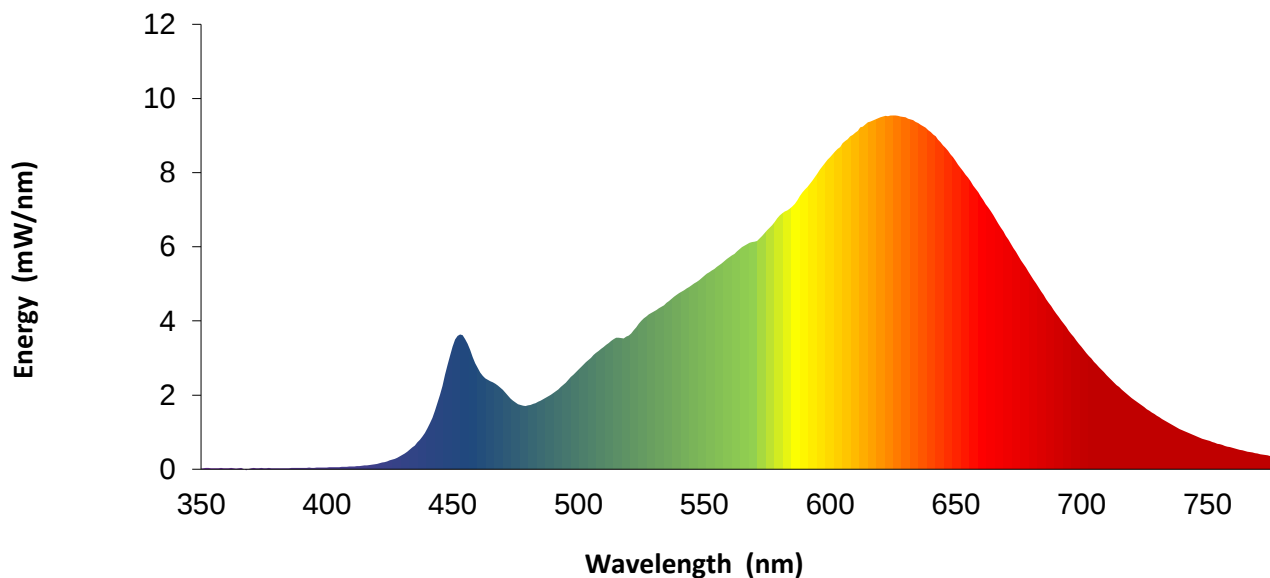


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.0		460	2.7		570	6.1		680	5.2
355	0.0		465	2.4		575	6.4		685	4.7
360	0.0		470	2.1		580	6.8		690	4.2
365	0.0		475	1.8		585	7.1		695	3.7
370	0.0		480	1.7		590	7.5		700	3.3
375	0.0		485	1.8		595	8.0		705	2.9
380	0.0		490	2.1		600	8.4		710	2.5
385	0.0		495	2.3		605	8.8		715	2.2
390	0.0		500	2.7		610	9.1		720	1.9
395	0.0		505	3.0		615	9.4		725	1.7
400	0.1		510	3.3		620	9.5		730	1.4
405	0.1		515	3.5		625	9.5		735	1.2
410	0.1		520	3.6		630	9.5		740	1.1
415	0.1		525	4.0		635	9.3		745	0.9
420	0.1		530	4.3		640	9.1		750	0.8
425	0.2		535	4.5		645	8.7		755	0.7
430	0.4		540	4.7		650	8.3		760	0.6
435	0.6		545	5.0		655	7.9		765	0.5
440	1.1		550	5.2		660	7.4		770	0.4
445	2.0		555	5.5		665	6.9		775	0.4
450	3.3		560	5.7		670	6.3		780	0.3
455	3.5		565	6.0		675	5.7		---	---

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

REPORT NO. 104941221CHI-021

#	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	VBUE	VBUE
4	Newport Thermohygrometer	iServer	CHI0452	2/3/2022	2/3/2023
5	Chroma Power Supply	61604	CHI0371	VBUE	VBUE
8	Newport Humidity Recorder	iServer	146961	9/21/2021	9/21/2022
9	Labsphere Spectroradiometer	CDS2600	CHI0539	VBUE	VBUE
10	3 Meter Sphere	SPR600	CHI0088	VBUE	VBUE
11	Elgar AC Power Supply	CW1251	146112	VBUE	VBUE
12	Sorenson DC Power Supply	XFR150-8	146846	VBUE	VBUE
13	Yokogawa Power Meter	WT1600	146767	4/4/2022	4/4/2023
17	Omega thermometer	USB TC08	EQA002615	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

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDOBT5NB-LED927	NA

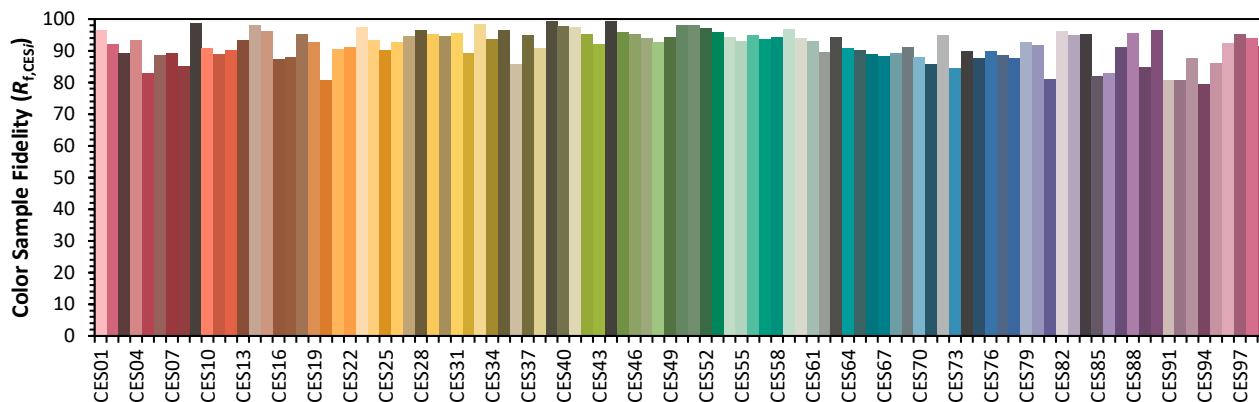
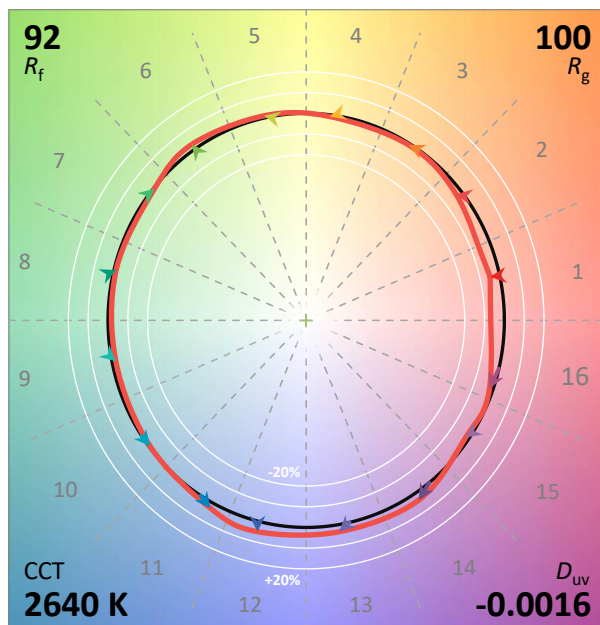
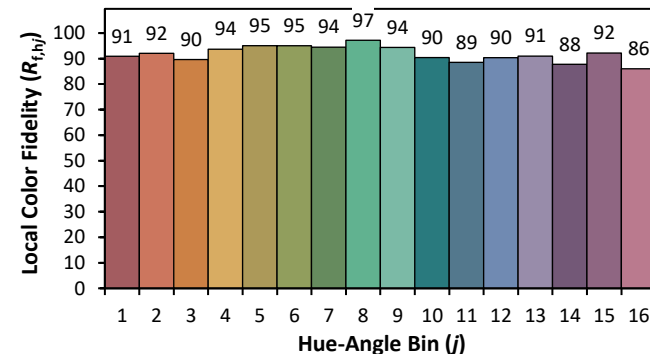
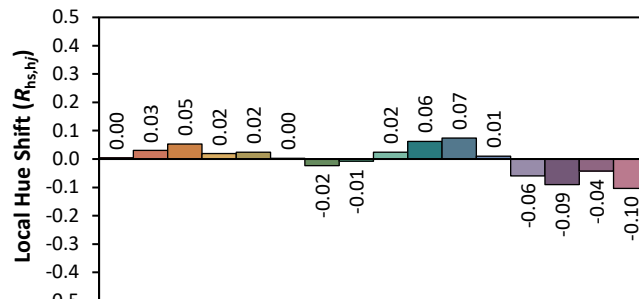
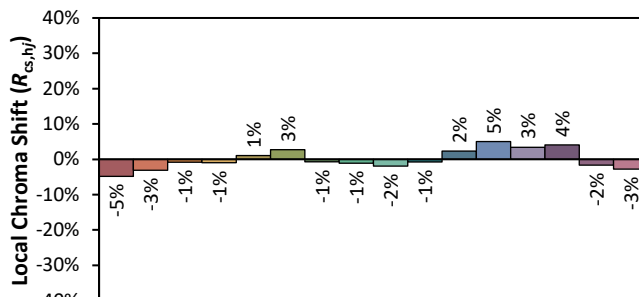
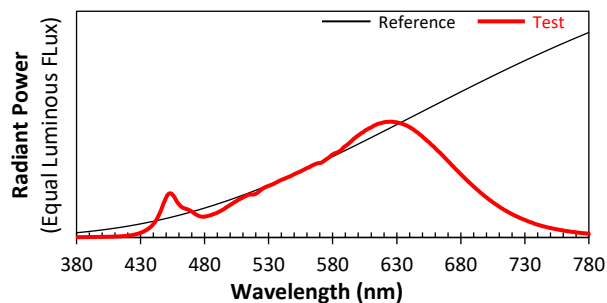
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 4/19/2022

Model: 700TDOBT5NB-LED927



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

 x 0.4621 y 0.4068 u' 0.2657 v' 0.5262