

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700TDOBT9NB-LED927

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CHI-007

ISSUE DATE

2/14/2022

REVISED DATE

None

TEST DATES

2022-02-11.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CHI-007

MODEL NUMBER(s)

700TDOBT9NB-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
Position
Lighting Division

Reviewer:



Jeff Davis
N.A. Technical Lead
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SAMPLE INFORMATION

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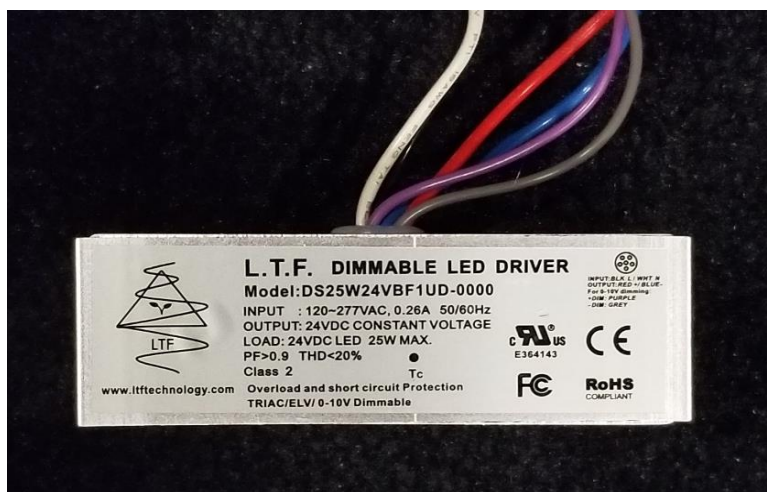
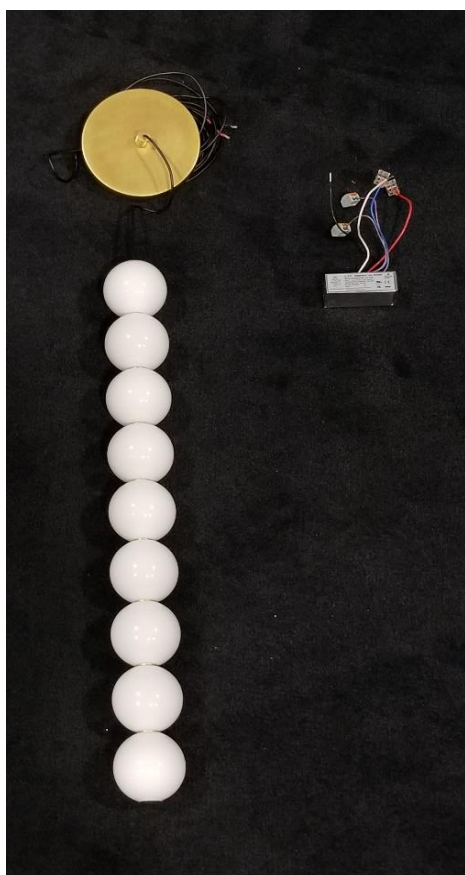
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH02092022022133	700TDOBT9NB-LED927	Orbet 9-Light Pendant	Production	2/9/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700TDOBT9NB-LED927	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700TDOBT9NB-LED927
Product Description:	Orbet 9-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)	748.6	783.0
Input Power (W) @ 120 (Vac)	13.23	13.26
Lumen Efficacy (lm/W)	56.6	59.0
Input Power Factor () @ 120 (Vac)	0.940	0.941

Criteria	Results
Input ATHD (%) @ 120 (Vac)	18.46
Correlated Color Temperature (K)	2640
Color Rendering Index - Ra ()	93.0
Color Rendering Index - R9 ()	60.9
Duv ()	-0.0013
Chromaticity Coordinate (x)	0.463
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.266
Chromaticity Coordinate (v')	0.527
Input Power (W) @ 277 (Vac)	14.12
Input Power Factor () @ 277 (Vac)	0.789
Input ATHD (%) @ 277 (Vac)	18.79

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	700TDOB9NB-LED927	NA

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

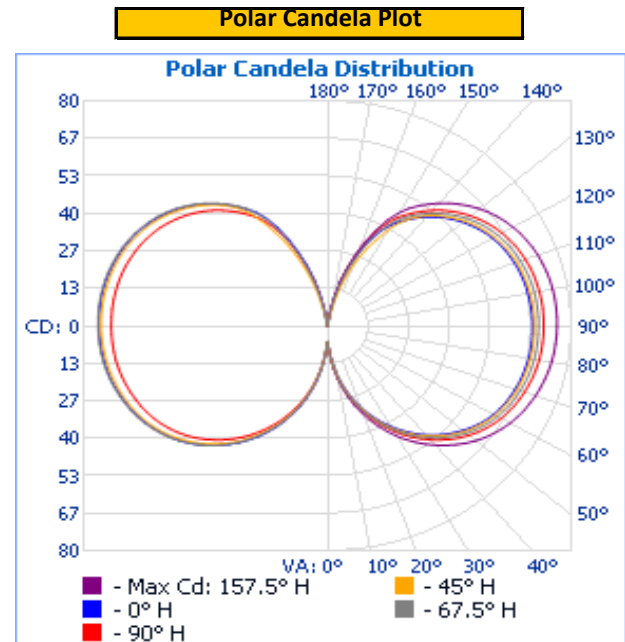
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)
Up	119.96	117.3	13.23	0.940

Light Output (lm)	Lumen Efficacy (lm/W)
748.6	56.6

INTENSITY SUMMARY - CANDELA

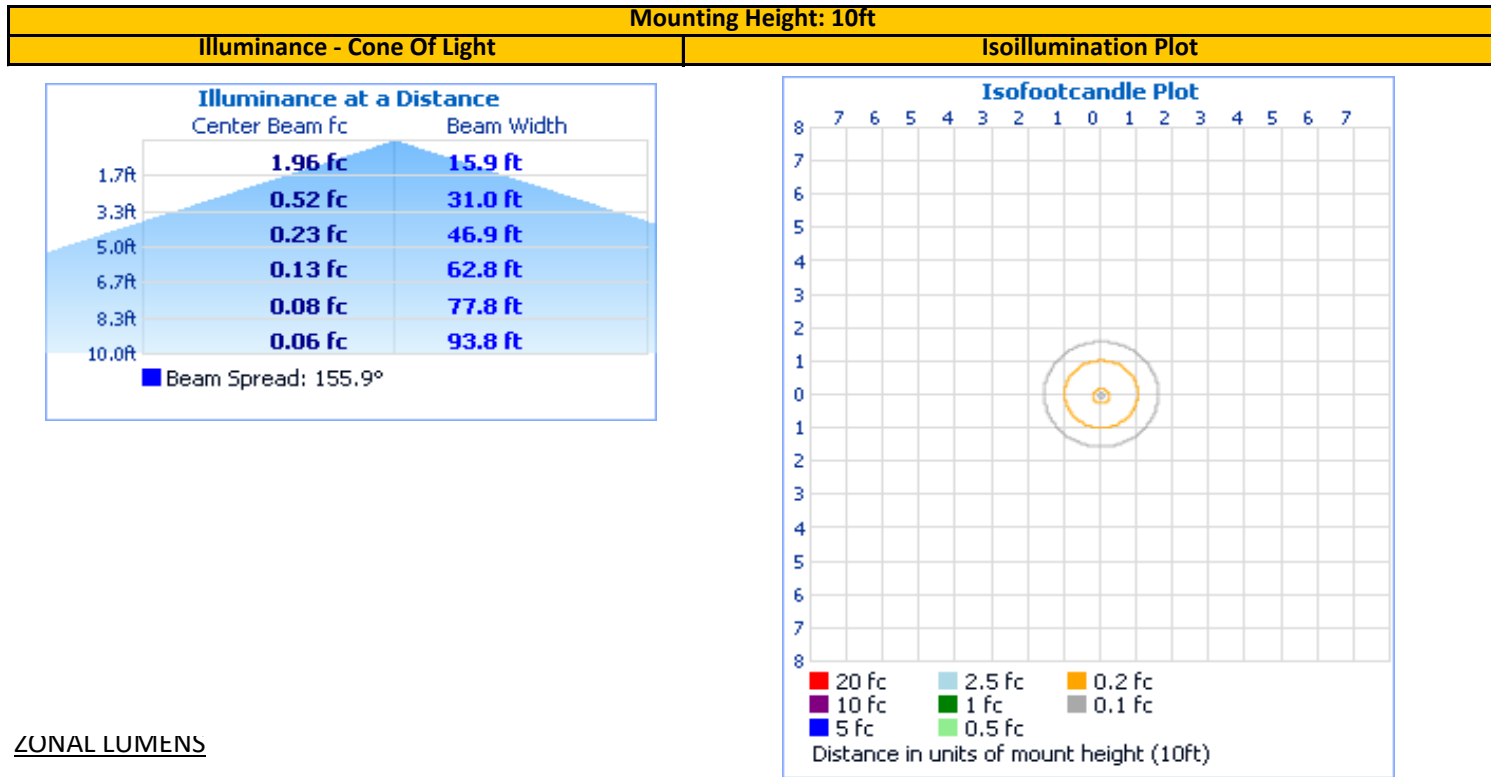
Angle	0	22.5	45	67.5	90
0	5.7	5.7	5.7	5.7	5.7
5	10.7	11.0	11.0	11.1	11.2
10	17.4	17.7	17.8	18.0	18.3
15	23.9	24.3	24.3	24.7	25.1
20	30.0	30.4	30.6	31.0	31.6
25	35.9	36.1	36.5	37.0	37.6
30	41.2	41.4	41.9	42.4	43.2
35	46.2	46.3	46.8	47.4	48.3
40	50.7	50.7	51.2	51.9	52.9
45	54.7	54.6	55.1	56.0	57.0
50	57.9	57.9	58.5	59.4	60.6
55	60.8	60.6	61.3	62.3	63.5
60	63.0	62.8	63.5	64.5	65.8
65	64.5	64.3	65.0	66.2	67.6
70	65.6	65.4	66.2	67.4	68.8
75	66.5	66.3	67.0	68.3	69.8
80	67.0	66.8	67.6	68.9	70.5
85	67.3	67.1	67.9	69.2	70.9
90	67.3	67.1	68.0	69.3	71.0
95	67.2	66.9	67.9	69.2	70.9
100	66.8	66.6	67.5	68.9	70.6
105	66.2	66.0	66.9	68.3	70.1
110	65.4	65.1	66.1	67.4	69.1
115	64.2	63.9	64.8	66.2	67.8
120	62.5	62.2	63.1	64.5	66.1
125	60.3	60.1	60.9	62.3	63.9
130	57.6	57.4	58.2	59.5	61.0
135	54.4	54.2	54.9	56.1	57.6
140	50.6	50.3	51.1	52.2	53.6
145	46.2	46.0	46.4	47.8	49.0
150	41.5	40.6	39.1	42.2	44.0
155	34.4	32.8	30.0	34.1	36.5
160	25.1	23.7	20.8	24.7	26.6
165	16.1	14.2	10.8	14.6	16.7
170	5.8	4.2	1.9	4.2	5.9
175	0.0	0.0	0.0	0.0	0.0
180	0.0	0.0	0.0	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	26.2	3.5%	90-100	77.5	10.3%
0-40	56.7	7.6%	100-110	74.1	9.9%
0-60	157.9	21.1%	110-120	67.4	9.0%
60-90	218.5	29.2%	120-130	57.3	7.7%
70-100	228.8	30.6%	130-140	44.6	6.0%
90-120	219.0	29.3%	140-150	30.7	4.1%
0-90	376.4	50.3%	150-160	16.1	2.2%
90-180	372.3	49.7%	160-170	4.4	0.6%
0-180	748.6	100.0%	170-180	0.1	0.0%

INTEGRATING SPHERE TESTING

REPORT NO. 104941221CHI-007

Test Configuration	Tested Model No.	Pass/Fail/NA
1	700TDOBT9NB-LED927	NA

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

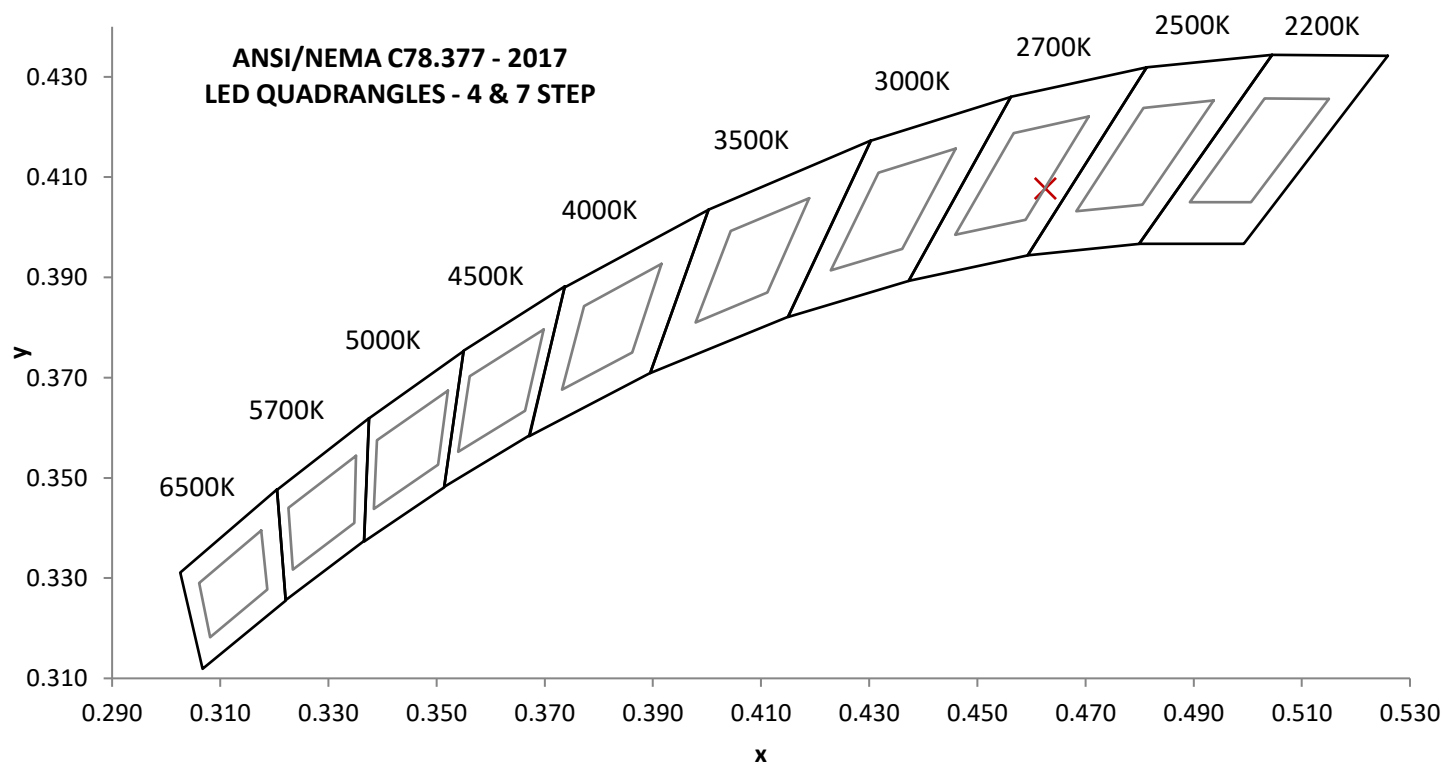
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
119.97	117.5	13.26	0.941	18.46
277.00	64.7	14.12	0.789	18.79

Measured at 119.97(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
783.0	59.0	2640	93.0	60.9

Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0013	0.463	0.408	0.266	0.527

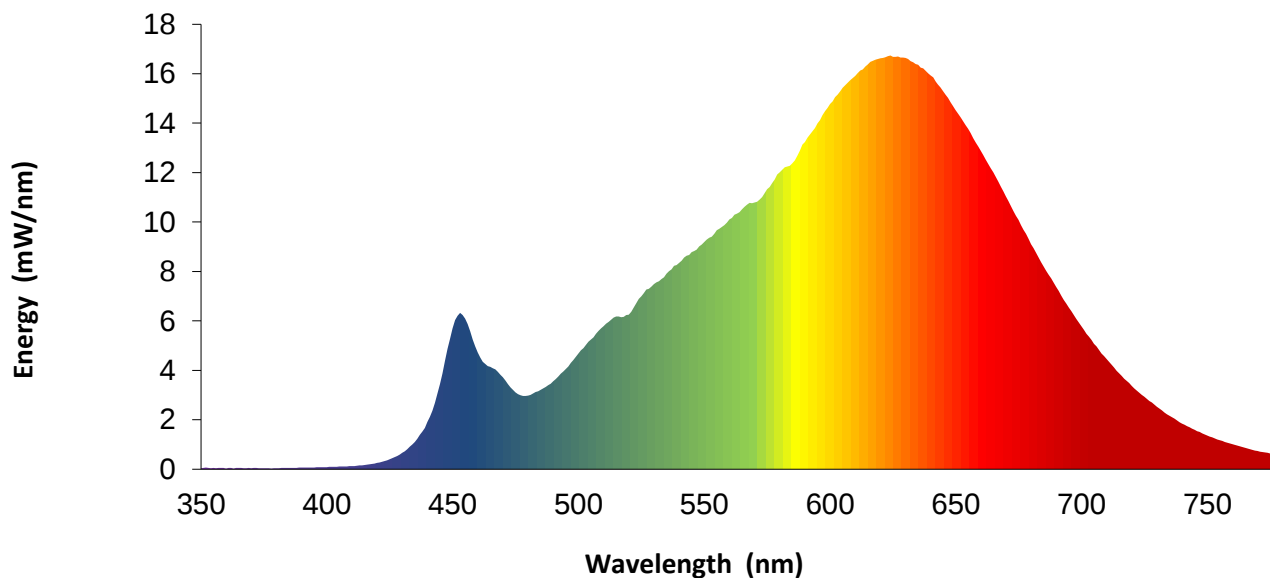


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.0		460	4.7		570	10.8		680	9.1
355	0.1		465	4.1		575	11.3		685	8.2
360	0.0		470	3.7		580	12.0		690	7.4
365	0.1		475	3.1		585	12.4		695	6.5
370	0.0		480	3.0		590	13.2		700	5.8
375	0.0		485	3.2		595	14.0		705	5.1
380	0.0		490	3.6		600	14.8		710	4.5
385	0.1		495	4.1		605	15.4		715	3.9
390	0.1		500	4.7		610	15.9		720	3.4
395	0.1		505	5.2		615	16.4		725	2.9
400	0.1		510	5.8		620	16.6		730	2.5
405	0.1		515	6.2		625	16.7		735	2.2
410	0.1		520	6.3		630	16.6		740	1.8
415	0.2		525	7.0		635	16.4		745	1.6
420	0.3		530	7.5		640	15.9		750	1.4
425	0.4		535	7.9		645	15.3		755	1.2
430	0.7		540	8.3		650	14.5		760	1.0
435	1.1		545	8.8		655	13.8		765	0.9
440	1.9		550	9.2		660	12.9		770	0.7
445	3.4		555	9.7		665	12.0		775	0.6
450	5.7		560	10.1		670	11.0		780	0.5
455	6.1		565	10.5		675	10.1		---	---

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	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	4/8/2021	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

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	700TDOBT9NB-LED927	NA

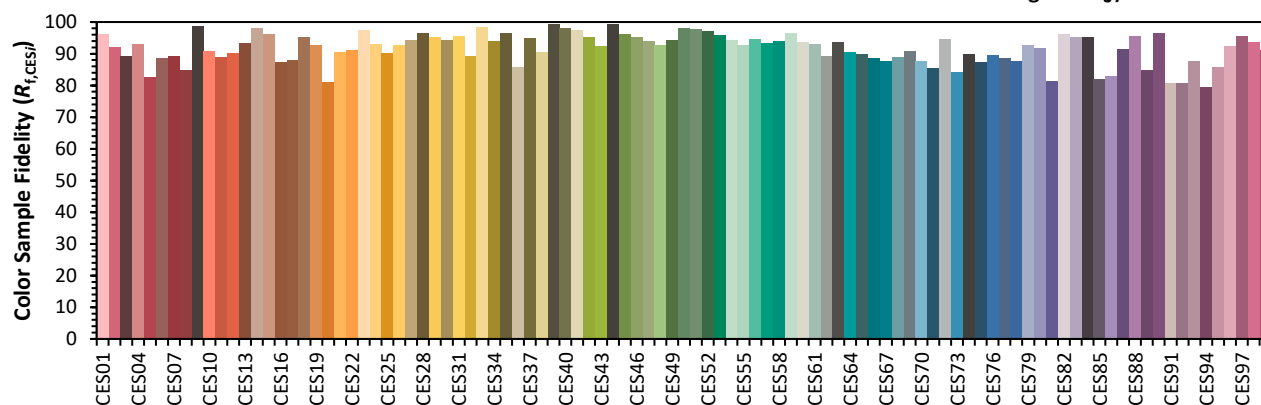
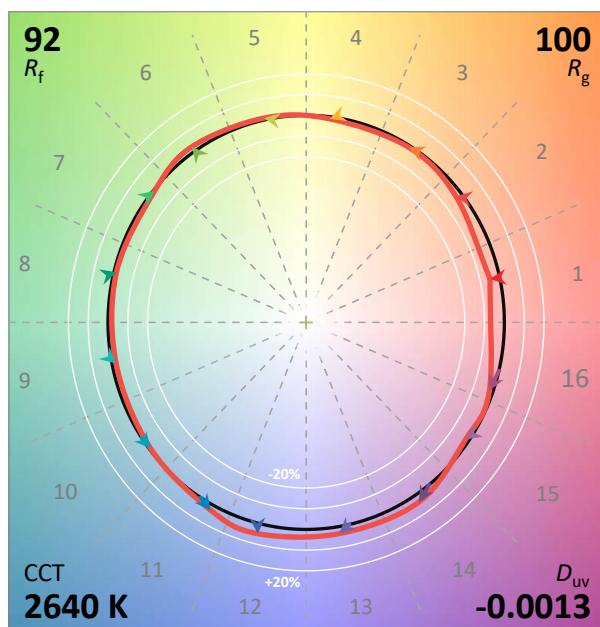
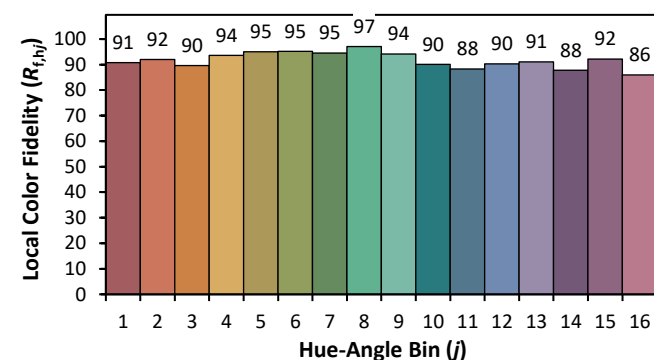
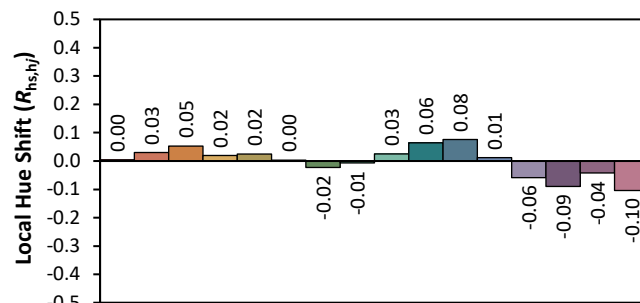
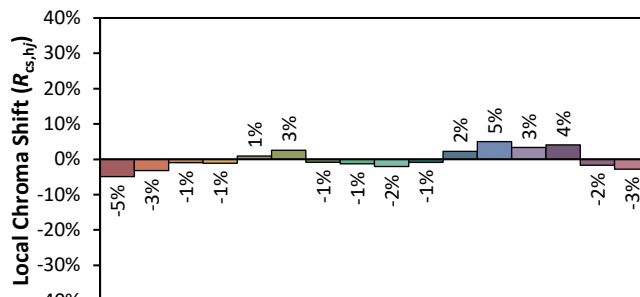
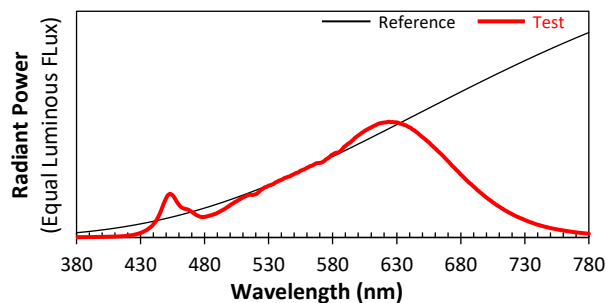
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 2/11/2022

Model: 700TDOBT9NB-LED927



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

x 0.4626

y 0.4077

u' 0.2656

v' 0.5266