

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700GRC48BW-LED930

PROJECT NUMBER

G104659241

REPORT NUMBER

104659241CHI-020

ISSUE DATE

11/16/2021

REVISED DATE

None

TEST DATES

11/10/2021 through 11/15/2021.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104659241CHI-020

MODEL NUMBER(s)

700GRC48BW-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:



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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	AH11032021022834	700GRC48BW-LED930	Grace 48 Chandelier	Production	11/3/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700GRC48BW-LED930	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700GRC48BW-LED930
Product Description:	Grace 48 Chandelier
LED Model No.:	R529.4 1/6 LED module
Driver Model No.:	DA50W1400C2036-3001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	4499.5	4623.3
Input Power (W) @ 120VAC (Vac)	123.44	123.56
Lumen Efficacy (lm/W)	36.5	37.4
Input Power Factor () @ 120VAC (Vac)	0.998	0.998

Criteria	Results
Input ATHD (%) @ 120VAC (Vac)	5.59
Correlated Color Temperature (K)	3023
Color Rendering Index - Ra ()	94.5
Color Rendering Index - R9 ()	67.1
Duv ()	-0.0033
Chromaticity Coordinate (x)	0.431
Chromaticity Coordinate (y)	0.394
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.516

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	700GRC48BW-LED930	NA

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

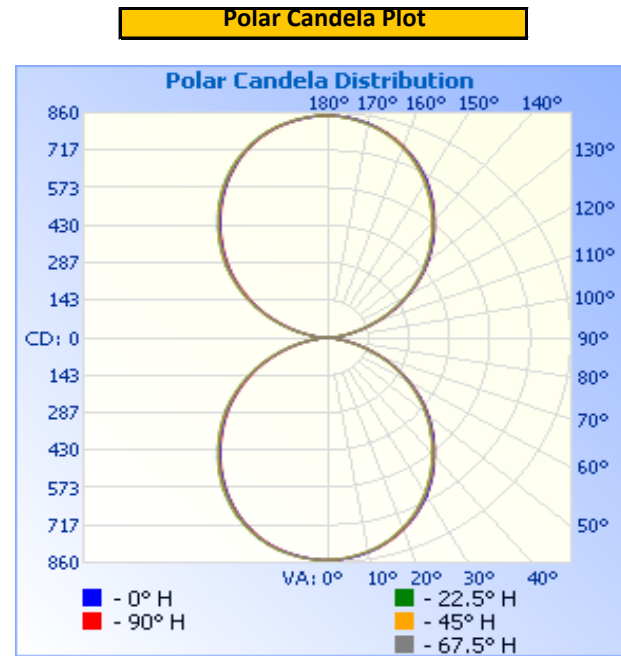
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)
Up	120.05	1030.2	123.44	0.998

Light Output (lm)	Lumen Efficacy (lm/W)
4499.5	36.5

INTENSITY SUMMARY - CANDELA

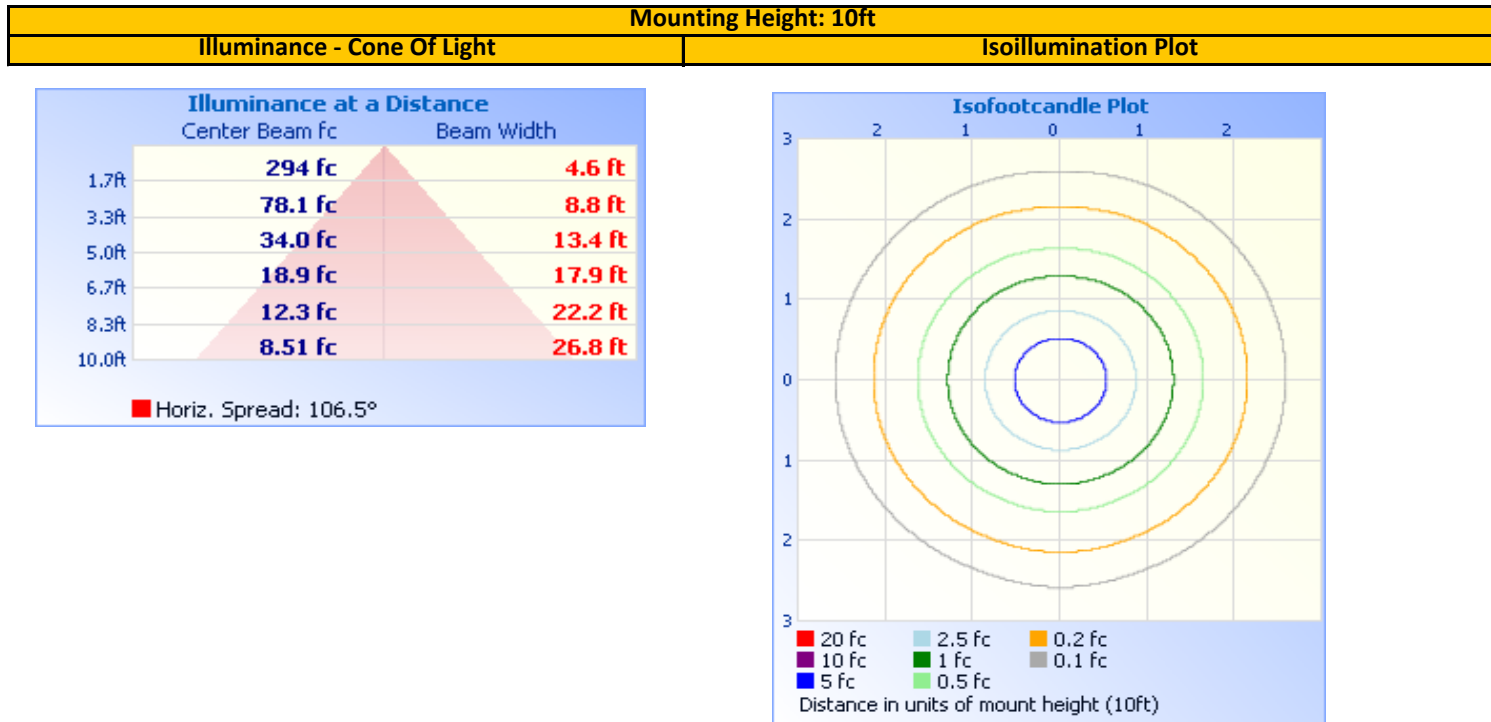
Angle	0	22.5	45	67.5	90
0	850.5	850.5	850.5	850.5	850.5
5	846.1	842.9	843.4	844.3	845.2
10	833.1	828.6	829.5	830.4	832.1
15	809	806.2	807.9	810.1	811.8
20	778.3	773.4	775.1	778.9	781
25	742.7	733.8	736	740.6	744.2
30	698.3	687.4	689.2	694.2	698.9
35	643.5	634.2	636.2	640.7	645.5
40	585.1	575.7	577.8	582.2	587
45	526.7	515.4	517.4	521.8	527.4
50	465	454.2	456.9	460.8	466.1
55	398.9	389.3	391.7	396	401.7
60	331.2	321.6	324.4	327.8	333.4
65	262.5	252.7	255.4	259.8	265.3
70	192.4	182.7	186	190.2	196.4
75	124.4	115.8	119	122.3	127.8
80	64	56.9	59.1	62.5	66.9
85	16.8	13.5	15.3	17.2	19.9
90	0.9	1.3	1.6	2	2.2
95	16.8	13.5	15.3	17.2	19.9
100	64	56.9	59.1	62.5	66.9
105	124.4	115.8	119	122.3	127.8
110	192.4	182.7	186	190.2	196.4
115	262.5	252.7	255.4	259.8	265.3
120	331.2	321.6	324.4	327.8	333.4
125	398.9	389.3	391.7	396	401.7
130	465	454.2	456.9	460.8	466.1
135	526.7	515.4	517.4	521.8	527.4
140	585.1	575.7	577.8	582.2	587
145	643.5	634.2	636.2	640.7	645.5
150	698.3	687.4	689.2	694.2	698.9
155	742.7	733.8	736	740.6	744.2
160	778.3	773.4	775.1	778.9	781
165	809	806.2	807.9	810.1	811.8
170	833.1	828.6	829.5	830.4	832.1
175	846.1	842.9	843.4	844.3	845.2
180	850.5	850.5	850.5	850.5	850.5

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	651.2	14.5%	0-10	80.2	1.8%
0-40	1,054.7	23.4%	10-20	228.7	5.1%
0-60	1,822.3	40.5%	20-30	342.2	7.6%
60-90	427.7	9.5%	30-40	403.5	9.0%
70-100	192.2	4.3%	40-50	407.8	9.1%
90-120	427.7	9.5%	50-60	359.8	8.0%
0-90	2,250.0	50.0%	60-70	263.2	5.9%
90-180	2,249.5	50.0%	70-80	136.7	3.0%
0-180	4,499.5	100.0%	80-90	27.7	0.6%
			90-100	27.7	0.6%
			100-110	136.7	3.0%
			110-120	263.2	5.9%
			120-130	359.7	8.0%
			130-140	407.7	9.1%
			140-150	403.4	9.0%
			150-160	342.1	7.6%
			160-170	228.7	5.1%
			170-180	80.2	1.8%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700GRC48BW-LED930	NA

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

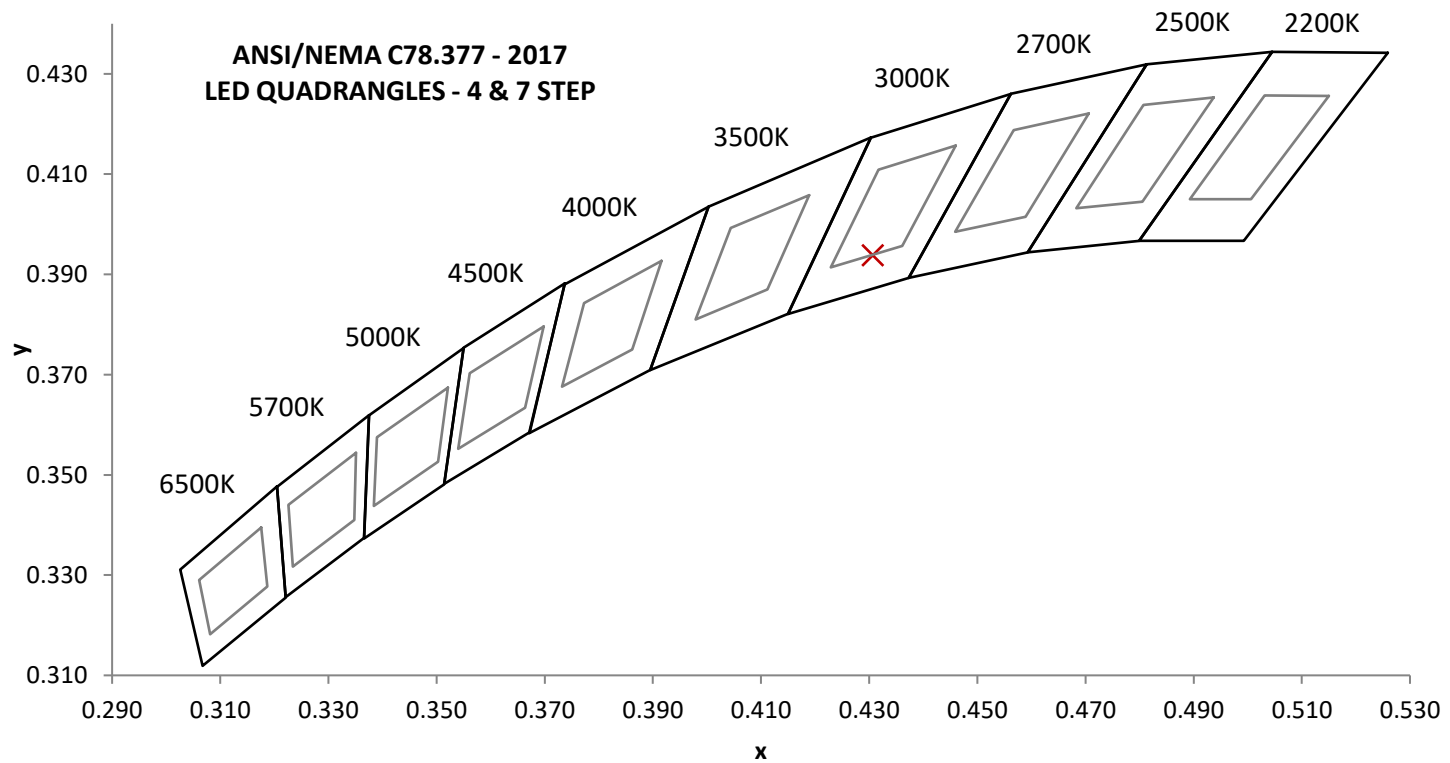
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (I)	Input ATHD (%)
119.98	1031.6	123.56	0.998	5.59

Measured at 119.98(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (I)	CRI - R9 (I)
4623.3	37.4	3023	94.5	67.1

Duv (I)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0033	0.431	0.394	0.251	0.516

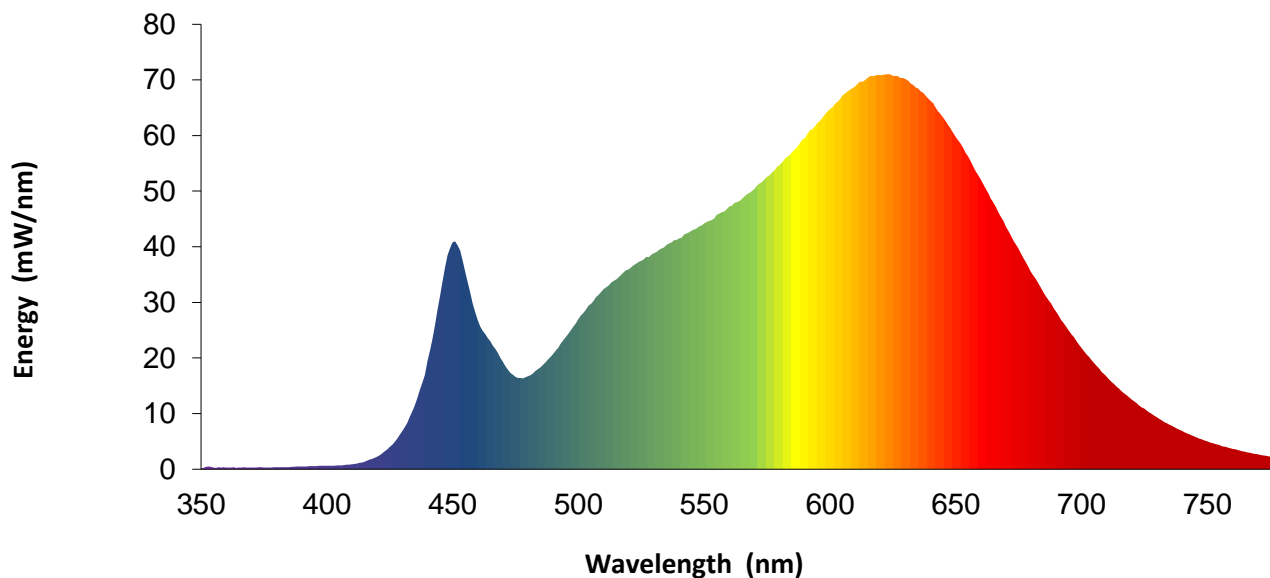


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	26.8		570	50.4		680	35.5
355	0.3		465	23.0		575	52.6		685	31.7
360	0.3		470	19.3		580	54.7		690	28.3
365	0.3		475	16.6		585	57.1		695	24.9
370	0.3		480	16.8		590	59.5		700	21.9
375	0.3		485	18.4		595	62.3		705	19.1
380	0.4		490	20.8		600	64.8		710	16.6
385	0.4		495	23.8		605	67.3		715	14.5
390	0.5		500	27.0		610	68.8		720	12.5
395	0.6		505	29.7		615	70.4		725	10.9
400	0.6		510	32.4		620	70.8		730	9.3
405	0.7		515	34.1		625	70.7		735	8.0
410	0.9		520	35.9		630	70.1		740	6.9
415	1.4		525	37.5		635	68.4		745	5.9
420	2.3		530	38.9		640	66.2		750	5.0
425	4.0		535	40.4		645	63.3		755	4.3
430	6.8		540	41.5		650	59.8		760	3.7
435	11.5		545	42.9		655	56.2		765	3.1
440	19.4		550	44.2		660	52.1		770	2.7
445	31.1		555	45.7		665	48.0		775	2.3
450	40.8		560	47.3		670	43.6		780	2.0
455	35.5		565	48.6		675	39.7		---	---

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

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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

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	700GRC48BW-LED930	NA

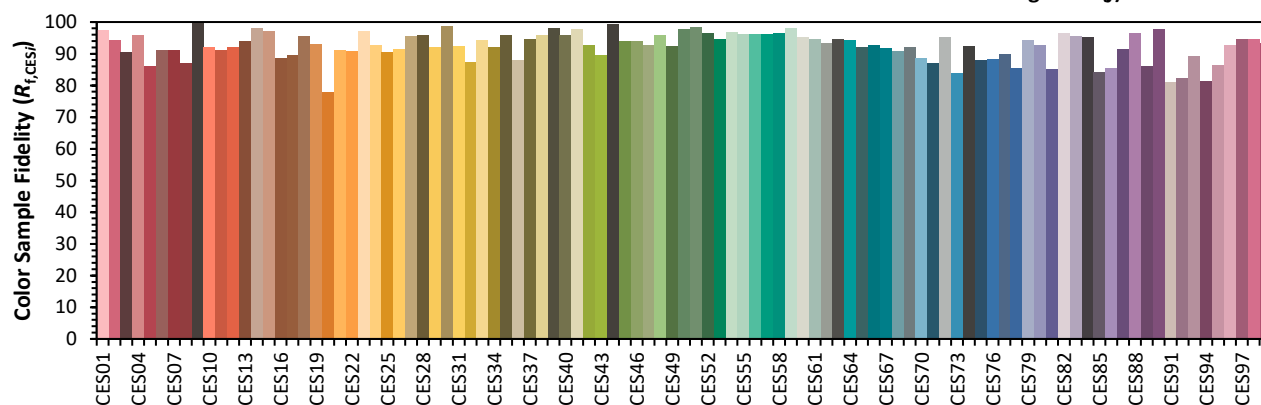
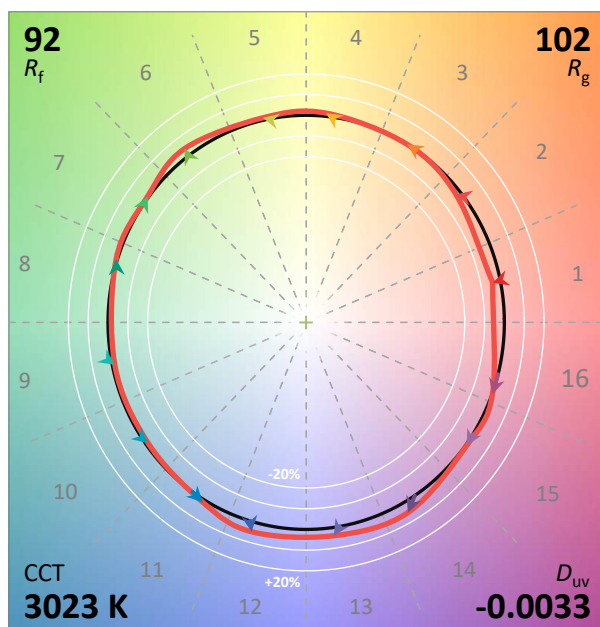
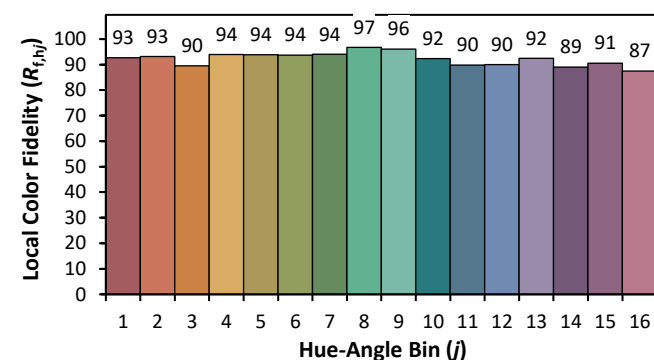
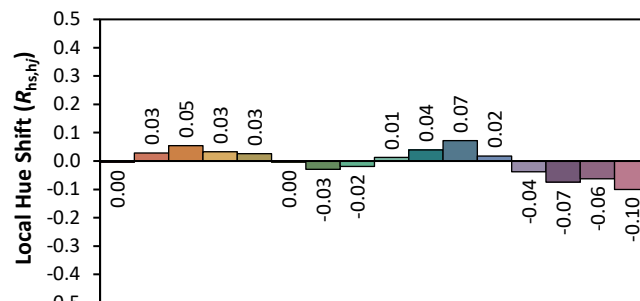
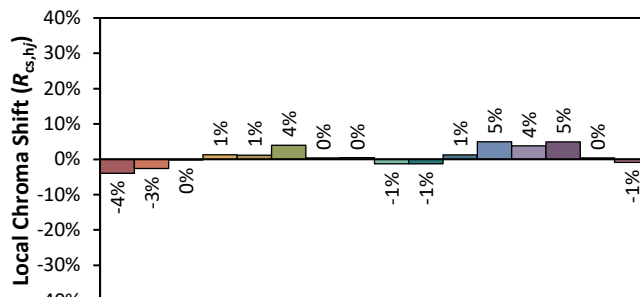
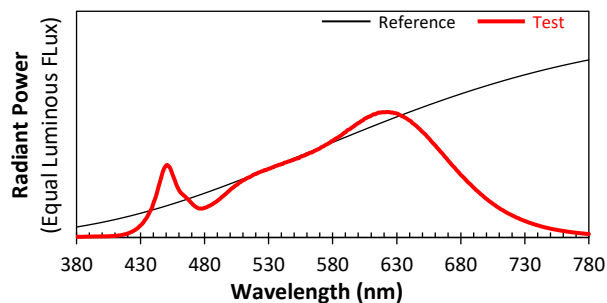
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: VISUAL COMFORT AND COMPANY

Date: 11/15/2021

Model: 700GRC48BW-LED930



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

 x 0.4307 y 0.3938 u' 0.2510 v' 0.5163