

VISUAL COMFORT & COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700FJLNGFB-LED930

PROJECT NUMBER

G104349704

REPORT NUMBER

104349704CHI-036

ISSUE DATE

10/27/2020

REVISED DATE

None

TEST DATES

10/17/2020.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104349704CHI-036

MODEL NUMBER(s)

700FJLNGFB-LED930

REPORT RENDERED TO:

VISUAL COMFORT & 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-01080748-3.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:



Ian Smith
Engineer
Lighting Division

Reviewer:



Jeff Davis
NA 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	AH10142020032432	700FJLNGFB-LED930	MINI LINGER PENDANT	Production	10/14/2020

TESTED SAMPLE CONFIGURATIONS

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

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700FJLNGFB-LED930
Product Description:	MINI LINGER PENDANT
LED Model No.:	CITIZEN CLU028-1203C4-303H5M3-F1
Driver Model No.:	LTF DL16W150C3337-3001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	520.9	538.3
Input Power (W) @ 12VAC (Vac)	6.84	6.86
Lumen Efficacy (lm/W)	76.2	78.4
Input Power Factor (I) @ 12VAC (Vac)	0.968	0.970

Criteria	Results
Input ATHD (%) @ 12VAC (Vac)	22.42
Correlated Color Temperature (K)	3019
Color Rendering Index - Ra (I)	92.8
Color Rendering Index - R9 (I)	58.1
Duv (I)	0.0004
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.522

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. 104349704CHI-036

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

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

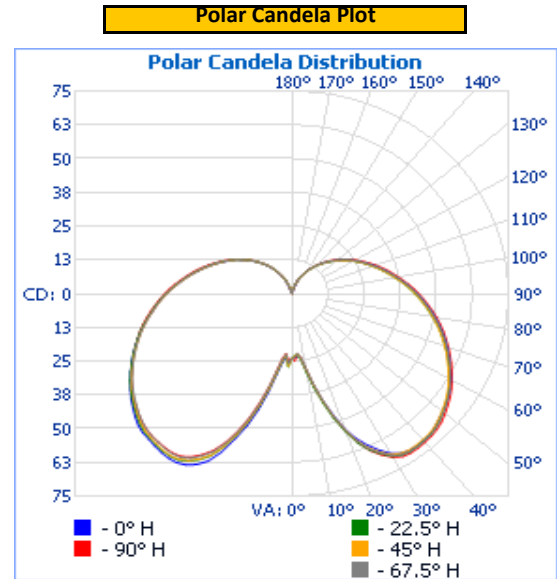
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Horizontal	12.0	589.5	6.84	0.968

Light Output (lm)	Lumen Efficacy (lm/W)
520.9	76.2

INTENSITY SUMMARY - CANDELA

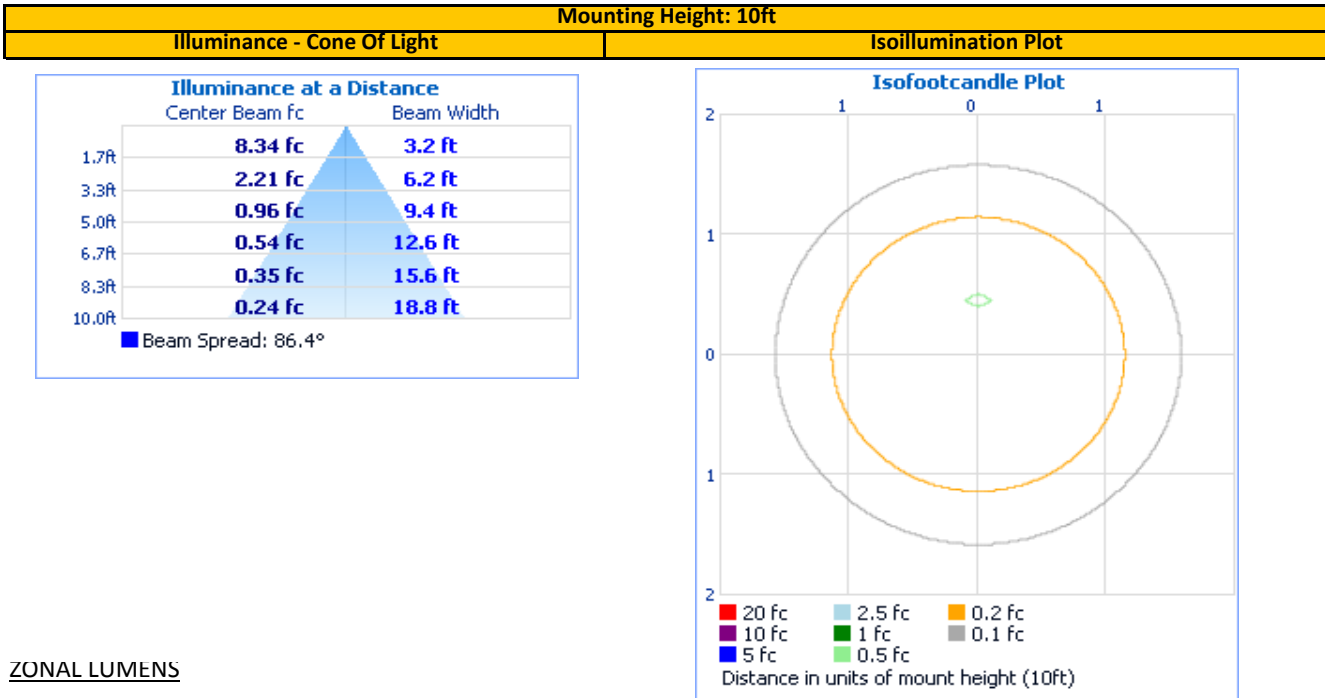
Angle	0	22.5	45	67.5	90
0	24	24	24	24	24
5	23	23	22	22	22
10	29	30	29	28	28
15	41	42	41	41	41
20	53	54	53	54	54
25	62	64	63	64	64
30	68	70	69	69	70
35	71	71	71	71	72
40	71	71	71	71	72
45	70	70	70	70	71
50	68	68	68	68	69
55	66	66	66	66	67
60	64	63	63	64	64
65	60	60	60	60	61
70	57	56	56	57	58
75	54	53	53	54	54
80	50	50	50	50	51
85	47	46	46	47	47
90	43	43	43	44	44
95	40	39	39	40	40
100	36	36	36	37	37
105	33	33	33	33	34
110	30	30	30	30	31
115	27	27	27	27	28
120	24	24	24	25	25
125	22	22	22	22	22
130	19	19	19	19	19
135	16	16	16	16	17
140	14	14	14	14	14
145	11	11	11	11	12
150	9	9	9	9	9
155	6	6	6	6	6
160	4	4	4	4	4
165	0	2	2	2	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary																																																																																																			
<table><tr><th>Zone</th><th>Lumens</th><th>Luminaire</th></tr><tr><td>0-30</td><td>44.4</td><td>8.5%</td></tr><tr><td>0-40</td><td>89.4</td><td>17.2%</td></tr><tr><td>0-60</td><td>203.8</td><td>39.1%</td></tr><tr><td>60-90</td><td>167.8</td><td>32.2%</td></tr><tr><td>70-100</td><td>151.4</td><td>29.1%</td></tr><tr><td>90-120</td><td>106.0</td><td>20.3%</td></tr><tr><td>0-90</td><td>371.7</td><td>71.4%</td></tr><tr><td>90-180</td><td>149.2</td><td>28.6%</td></tr><tr><td>0-180</td><td>520.9</td><td>100.0%</td></tr></table>			Zone	Lumens	Luminaire	0-30	44.4	8.5%	0-40	89.4	17.2%	0-60	203.8	39.1%	60-90	167.8	32.2%	70-100	151.4	29.1%	90-120	106.0	20.3%	0-90	371.7	71.4%	90-180	149.2	28.6%	0-180	520.9	100.0%	<table><tr><th>Zone</th><th>Lumens</th><th>Total</th><th>Zone</th><th>Lumens</th><th>Total</th></tr><tr><td>0-10</td><td>2.4</td><td>0.5%</td><td>90-100</td><td>43.5</td><td>8.4%</td></tr><tr><td>10-20</td><td>12.2</td><td>2.4%</td><td>100-110</td><td>35.3</td><td>6.8%</td></tr><tr><td>20-30</td><td>29.7</td><td>5.7%</td><td>110-120</td><td>27.2</td><td>5.2%</td></tr><tr><td>30-40</td><td>45.1</td><td>8.7%</td><td>120-130</td><td>19.7</td><td>3.8%</td></tr><tr><td>40-50</td><td>54.8</td><td>10.5%</td><td>130-140</td><td>12.8</td><td>2.5%</td></tr><tr><td>50-60</td><td>59.6</td><td>11.4%</td><td>140-150</td><td>7.2</td><td>1.4%</td></tr><tr><td>60-70</td><td>60.0</td><td>11.5%</td><td>150-160</td><td>3.0</td><td>0.6%</td></tr><tr><td>70-80</td><td>56.9</td><td>10.9%</td><td>160-170</td><td>0.5</td><td>0.1%</td></tr><tr><td>80-90</td><td>51.0</td><td>9.8%</td><td>170-180</td><td>0.0</td><td>0.0%</td></tr></table>							Zone	Lumens	Total	Zone	Lumens	Total	0-10	2.4	0.5%	90-100	43.5	8.4%	10-20	12.2	2.4%	100-110	35.3	6.8%	20-30	29.7	5.7%	110-120	27.2	5.2%	30-40	45.1	8.7%	120-130	19.7	3.8%	40-50	54.8	10.5%	130-140	12.8	2.5%	50-60	59.6	11.4%	140-150	7.2	1.4%	60-70	60.0	11.5%	150-160	3.0	0.6%	70-80	56.9	10.9%	160-170	0.5	0.1%	80-90	51.0	9.8%	170-180	0.0	0.0%
Zone	Lumens	Luminaire																																																																																																	
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INTEGRATING SPHERE TESTING

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

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

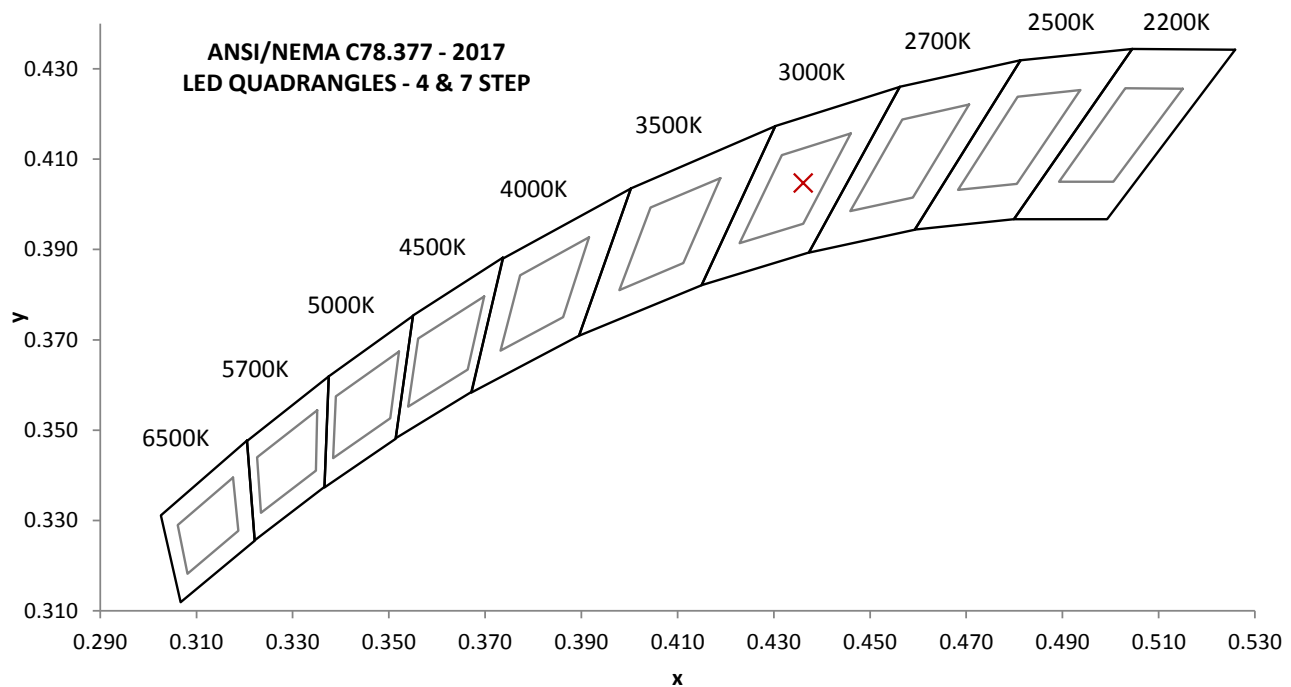
Base Orientation
Horizontal

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
12.00	589.3	6.86	0.970	22.42

Measured at 12(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
538.3	78.4	3019	92.8	58.1

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0004	0.436	0.405	0.250	0.522

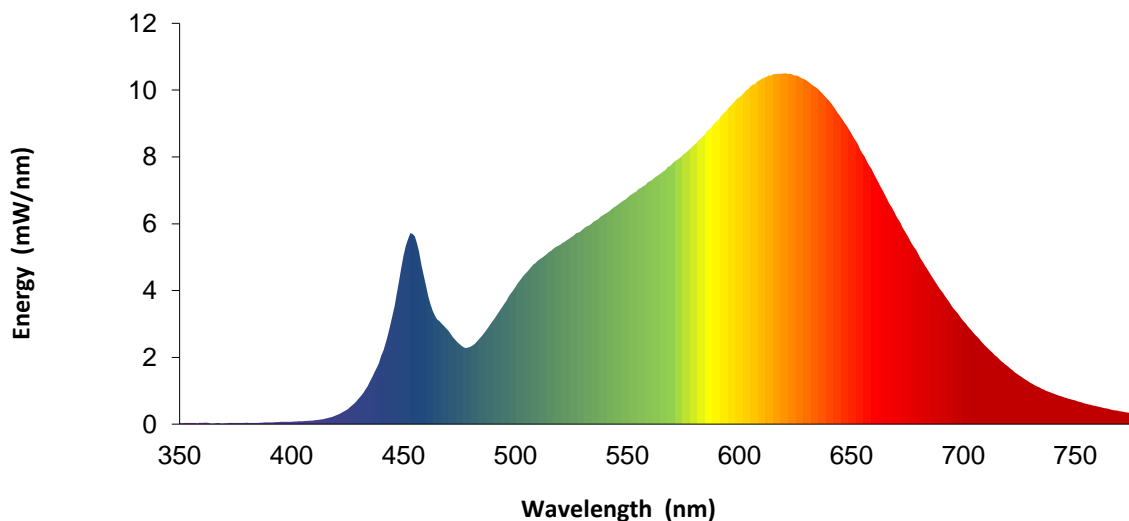


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.0		460	4.2		570	7.8		680	5.1
355	0.0		465	3.1		575	8.1		685	4.5
360	0.0		470	2.8		580	8.4		690	4.0
365	0.0		475	2.4		585	8.7		695	3.5
370	0.0		480	2.3		590	9.1		700	3.1
375	0.0		485	2.6		595	9.5		705	2.7
380	0.0		490	3.1		600	9.8		710	2.3
385	0.0		495	3.6		605	10.1		715	2.0
390	0.1		500	4.1		610	10.3		720	1.7
395	0.1		505	4.5		615	10.5		725	1.5
400	0.1		510	4.9		620	10.5		730	1.2
405	0.1		515	5.1		625	10.4		735	1.1
410	0.1		520	5.4		630	10.3		740	0.9
415	0.2		525	5.6		635	10.0		745	0.8
420	0.3		530	5.8		640	9.7		750	0.7
425	0.4		535	6.1		645	9.2		755	0.6
430	0.8		540	6.3		650	8.7		760	0.5
435	1.3		545	6.5		655	8.1		765	0.5
440	2.0		550	6.8		660	7.5		770	0.4
445	3.2		555	7.0		665	6.9		775	0.3
450	5.0		560	7.3		670	6.2		780	0.3
455	5.6		565	7.5		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. 104349704CHI-036

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Yokogawa Power Meter	WT210	146919	7/1/2020	7/1/2021
2	Omega Thermometer	DPI8-C24	146920	10/1/2020	10/1/2021
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	146957	12/2/2019	12/2/2020
5	Pacific AC Power Supply	118-ACX	CHI0153	VBU	VBU
6	Newport Humidity Recorder	iServer	146961	9/3/2020	9/3/2021
7	Labsphere Spectroradiometer	CDS2600	CHI0539	VBU	VBU
8	3 Meter Sphere	SPR600	CHI0088	VBU	VBU
9	Elgar AC Power Supply	CW1251	146112	VBU	VBU
10	Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
11	Yokogawa Power Meter	WT1600	146769	4/6/2020	4/6/2021
12	Extech K Temperature Meter	421502	CHI0476	10/1/2020	10/1/2021
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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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ANNEX A - TM-30 CALCULATIONS

REPORT NO. 104349704CHI-036

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

TM-30 REPORT

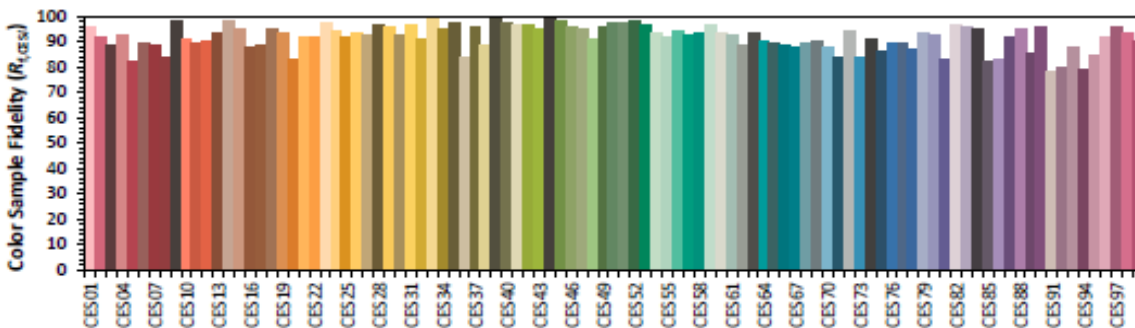
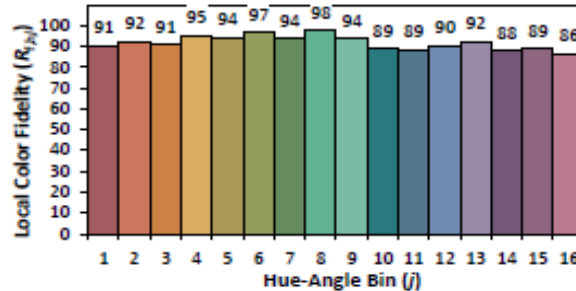
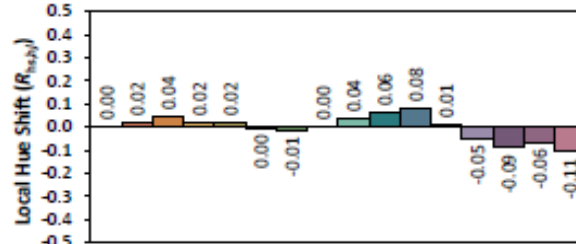
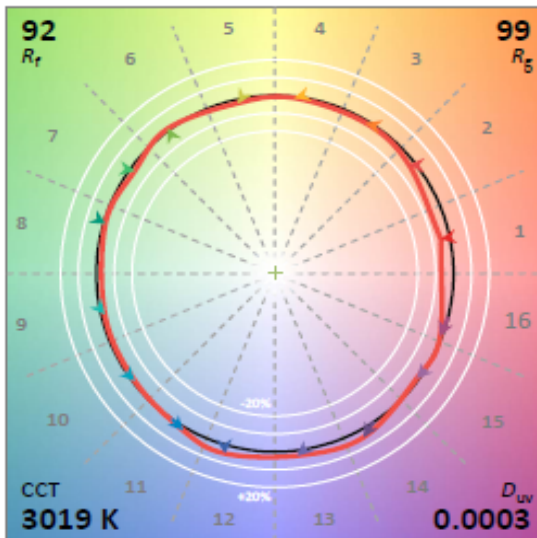
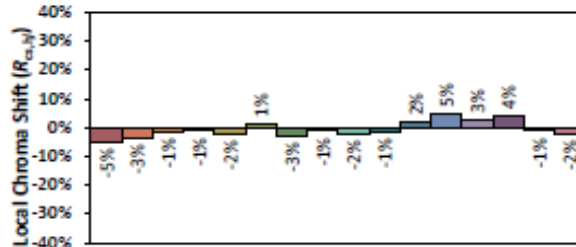
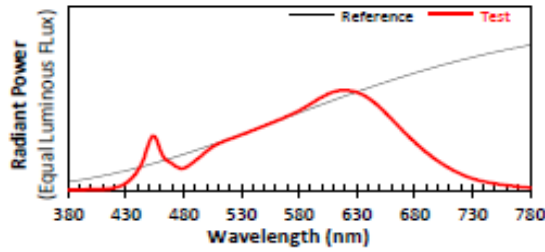
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Manufacturer: Generation Brands, LLC

Date: 10/17/2020

Model: 700FJLNGFB-LED930



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

x 0.4361
 y 0.4047
 u' 0.2498
 v' 0.5215

Colors are for visual orientation purposes only. Created with the IES TM-30-18 Calculator Version 2.00.