

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700FJPLNCB-LED930

PROJECT NUMBER

G104349704

REPORT NUMBER

104349704CRT-064

ISSUE DATE

2/22/2021

REVISED DATE

None

TEST DATES

2/19/2021

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104349704CRT-064

MODEL NUMBER(s)

700FJPLNCB-LED930

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077-3219
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. 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-01080748-1.

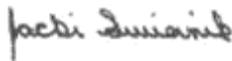
TEST STANDARDS

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:

Reviewer:



Jacki Swiernik
Staff Engineer
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Kristie Ray
Engineering Team Lead
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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2102151459-001	700FJPLNCB-LED930	MINI PALONA PENDANT	Production	2/15/2021

TESTED SAMPLE CONFIGURATIONS

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

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700FJPLNCB-LED930
Product Description:	MINI PALONA PENDANT
LED Model No.:	CITIZEN CLC020-057A5313H3H3-185
Driver Model No.:	DL16W150C3337-3001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	352.8	354.4
Input Power (W) @ 12 (Vac)	7.33	7.36
Lumen Efficacy (lm/W)	48.13	48.16
Input Power Factor (I) @ 12 (Vac)	0.978	0.978

Criteria	Results
Input ATHD (%) @ 12 (Vac)	18.68
Correlated Color Temperature (K)	2743
Color Rendering Index - Ra (I)	93.1
Color Rendering Index - R9 (I)	61.1
Duv (I)	0.002
Chromaticity Coordinate (x)	0.454
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.261
Chromaticity Coordinate (v')	0.524

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	700FJPLNCB-LED930	NA

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

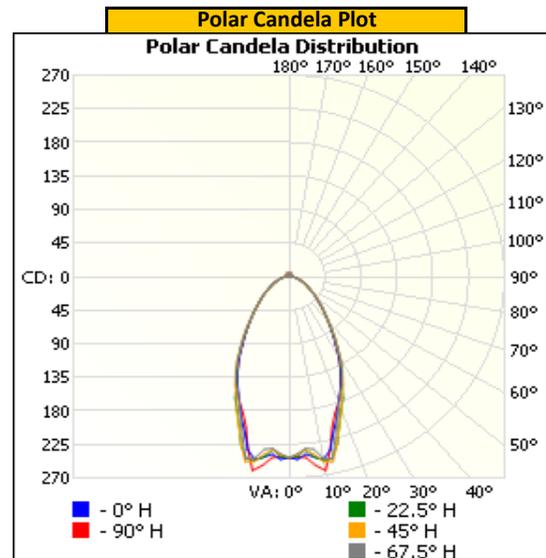
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	12.05	622.4	7.33	0.978

Light Output (lm)	Lumen Efficacy (lm/W)
352.8	48.1

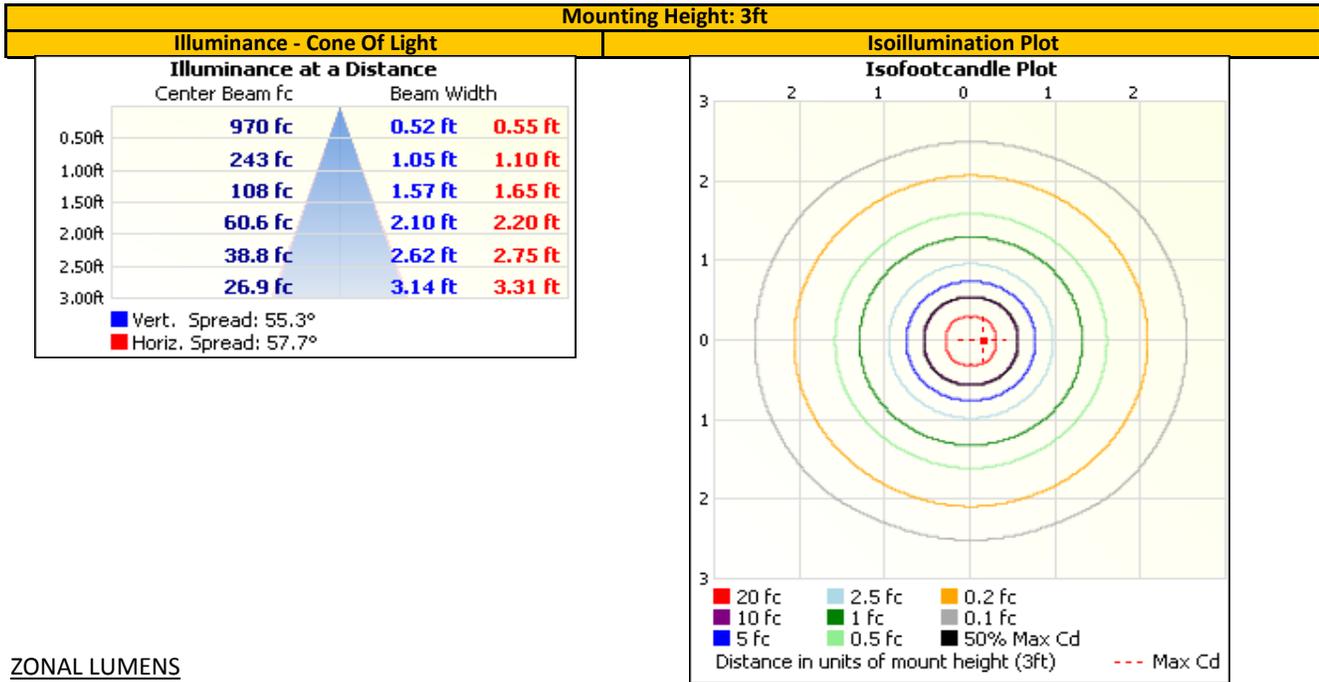
INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	242	242	242	242	242
5	239	233	233	231	244
10	249	250	252	247	264
15	215	233	232	224	208
20	181	190	192	182	180
25	154	156	160	157	153
30	125	128	130	129	126
35	97	98	101	100	97
40	74	75	76	76	75
45	59	58	58	58	57
50	46	46	46	46	44
55	36	35	35	36	35
60	28	27	26	27	26
65	21	21	21	21	21
70	16	16	17	16	16
75	12	12	12	12	13
80	9	9	9	9	9
85	7	6	6	7	6
90	4	4	4	4	4
95	2	2	2	2	2
100	2	2	2	2	2
105	2	2	2	2	2
110	2	2	2	2	2
115	2	2	2	2	2
120	2	2	2	2	2
125	2	2	2	2	2
130	2	2	3	2	2
135	2	2	3	3	3
140	3	3	4	3	3
145	4	3	4	3	3
150	3	3	3	3	3
155	4	4	4	5	5
160	4	4	4	5	5
165	1	0	1	2	2
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



ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	157.1	44.5%	90-100	2.6	0.7%
0-40	219.1	62.1%	100-110	1.9	0.5%
0-60	296.3	84.0%	110-120	2.1	0.6%
60-90	41.4	11.7%	120-130	1.8	0.5%
70-100	23.0	6.5%	130-140	2.1	0.6%
90-120	6.7	1.9%	140-150	2.0	0.6%
0-90	337.7	95.7%	150-160	2.0	0.6%
90-180	15.1	4.3%	160-170	0.5	0.1%
0-180	352.8	100.0%	170-180	0.0	0.0%

INTEGRATING SPHERE TESTING

REPORT NO. 104349704CRT-064

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

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

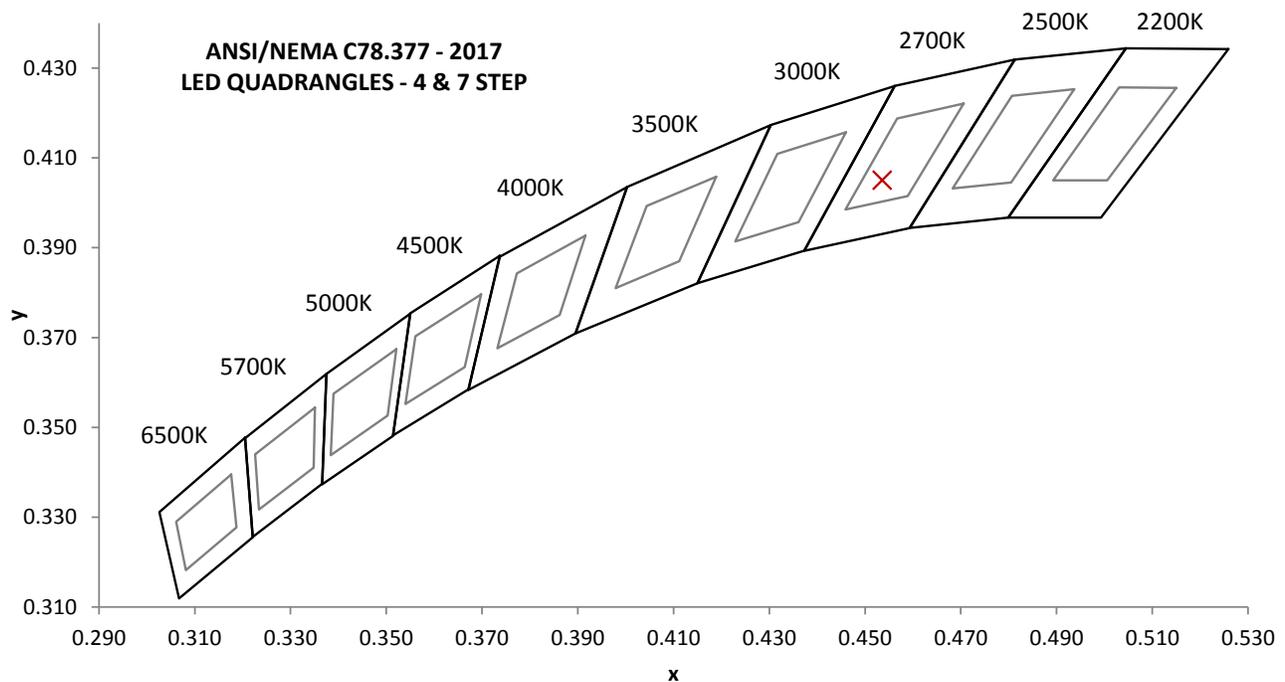
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
12.01	627.0	7.36	0.978	18.68

Measured at 12.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
354.4	48.2	2743	93.1	61.1

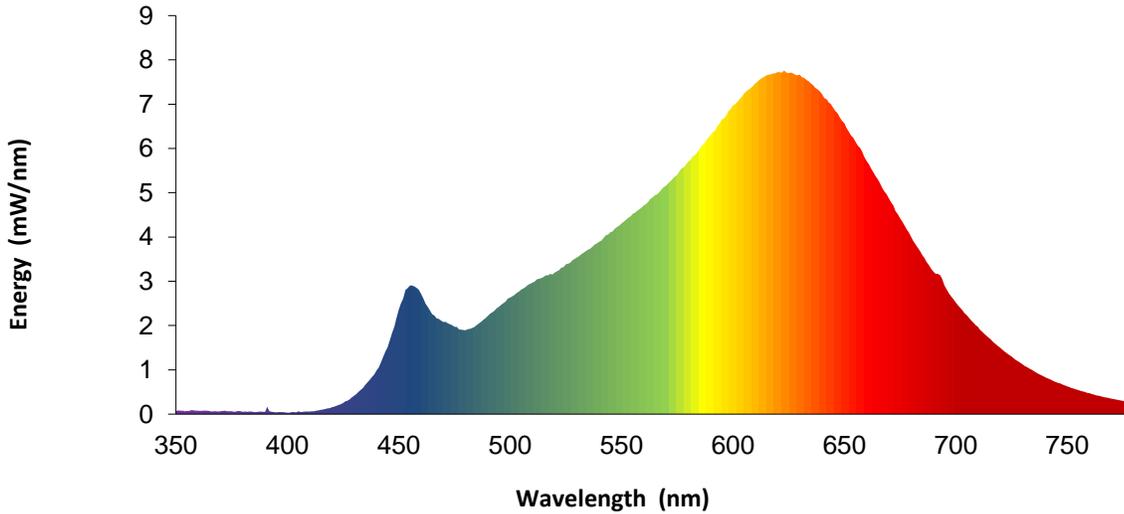
Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0018	0.454	0.405	0.261	0.524



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.1	460	2.7	570	5.2	680	4.0
355	0.1	465	2.3	575	5.4	685	3.6
360	0.1	470	2.1	580	5.7	690	3.2
365	0.1	475	2.0	585	6.0	695	2.9
370	0.1	480	1.9	590	6.3	700	2.5
375	0.1	485	2.0	595	6.6	705	2.2
380	0.1	490	2.2	600	7.0	710	2.0
385	0.0	495	2.4	605	7.2	715	1.7
390	0.1	500	2.6	610	7.5	720	1.5
395	0.0	505	2.8	615	7.6	725	1.3
400	0.0	510	3.0	620	7.7	730	1.1
405	0.1	515	3.1	625	7.7	735	1.0
410	0.1	520	3.2	630	7.7	740	0.8
415	0.1	525	3.4	635	7.5	745	0.7
420	0.2	530	3.5	640	7.2	750	0.6
425	0.3	535	3.7	645	6.9	755	0.5
430	0.4	540	3.9	650	6.6	760	0.5
435	0.7	545	4.1	655	6.2	765	0.4
440	1.0	550	4.3	660	5.7	770	0.3
445	1.5	555	4.5	665	5.3	775	0.3
450	2.4	560	4.7	670	4.9	780	0.3
455	2.9	565	4.9	675	4.4	---	---



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	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
2	Traceable Hygrothermometer	4800	L206	2/12/2021	2/12/2022
3	Yokogawa Power Analyzer	WT1600	E473	6/22/2020	6/22/2021
4	Fluke Thermometer	53 II	N1324	3/19/2020	3/19/2021
5	Fluke Multimeter	87V	D590	6/15/2020	6/15/2021
6	3M Integrating Sphere Spectrometer System	CDS 1100	---	2/1/2021	5/1/2021
7	Fisher Scientific Stopwatch	14-649-9	N1132	3/18/2020	3/18/2021
8	LSI High Speed Mirror Goniophotometer	6440	---	1/14/2021	4/14/2021
9	Elgar AC Power Supply	CW1251	---	VBU	VBU
10	Yokogawa Power Analyzer	WT210	E464	5/11/2020	5/11/2021
11	M-D Building Products Digital Level	Smart Tool	307-L112	5/14/2020	5/14/2021
12	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
13	Omega Thermometer	DPI8-C24	M263	2/27/2020	2/27/2021

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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