

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700OWNTE9Z-LED930

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-024

ISSUE DATE

7/28/2022

REVISED DATE

None

TEST DATES

7/18/2022 through 7/25/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-024

MODEL NUMBER(s)

700OWNTE9Z-LED930

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077

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-01236637-1.

TEST STANDARDS

ANSI/IES LM-79-19: Optical and Electrical Measurements of Solid State Lighting Products

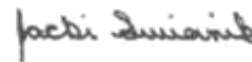
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2206301053-024	7000WNT9Z-LED930	Nate 9 Outdoor Wall	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	7000WNTE9Z-LED930
Product Description:	Nate 9 Outdoor Wall
LED Model No.:	AMPCO, LDM-10-6-C3-930
Driver Model No.:	AMPCO, UFE5-1Q-150F/A
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	31.0	38.1
Input Power (W) @ 120 (Vac)	5.86	5.86
Luminous Efficacy (lm/W)	5.29	6.50
Input Power Factor (I) @ 120 (Vac)	0.966	0.966

Criteria	Results
Input ATHD (%) @ 120 (Vac)	11.17
Correlated Color Temperature (K)	3155
Color Rendering Index - Ra (I)	91.2
Color Rendering Index - R9 (I)	57.5
Duv (I)	0.0009
Chromaticity Coordinate (x)	0.428
Chromaticity Coordinate (y)	0.403
Chromaticity Coordinate (u')	0.245
Chromaticity Coordinate (v')	0.520

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with ANSI/IES LM-79-19

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral power distribution for photometric and colorimetric data of 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 and relative humidity was measured at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ and 10-65% respectively at a position inside of the sphere within 1.5m and at equal height of the EUT. Stabilization procedures to LM-79-19 were followed. The EUT was mounted in a 4π configuration.

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 and relative humidity was measured at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ and 10-65% respectively at a position within 1.5m and at equal height of the EUT. Stabilization procedures to LM-79-19 were followed. The test distance was $\geq 5x$ the longest luminous dimension of the EUT.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

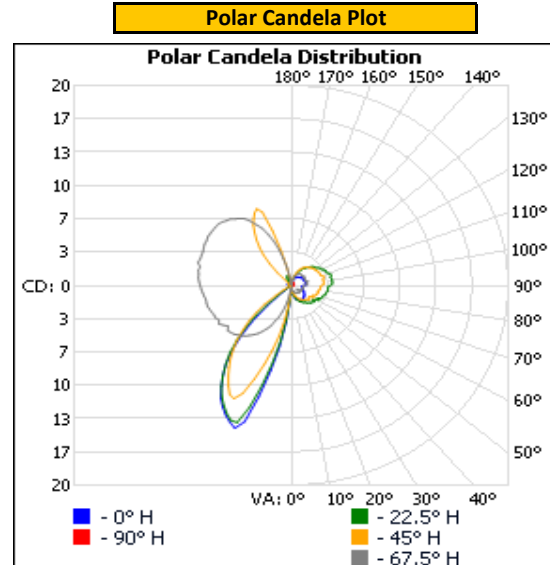
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	120.09	50.5	5.86	0.966

Light Output (lm)	Efficacy (lm/W)
31.0	5.3

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	0	0	0	0	0
5	0	0	0	0	0
10	1	1	1	0	0
15	1	1	1	0	0
20	2	2	1	1	0
25	2	2	1	1	0
30	2	2	2	1	0
35	2	2	2	1	0
40	2	2	2	1	0
45	2	2	2	1	0
50	2	3	2	1	0
55	2	2	2	1	0
60	1	3	2	1	0
65	1	3	2	1	0
70	1	3	2	1	0
75	1	3	2	1	0
80	1	3	3	1	0
85	1	3	3	1	0
90	1	4	3	1	0
95	1	4	3	2	0
100	1	4	3	2	0
105	1	4	3	2	0
110	1	4	3	1	0
115	1	4	3	1	0
120	1	3	3	1	0
125	1	3	3	2	0
130	1	3	3	1	0
135	1	3	2	1	0
140	1	2	2	1	0
145	1	2	2	1	0
150	1	2	2	1	0
155	1	2	2	1	0
160	1	1	1	1	0
165	1	1	1	1	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



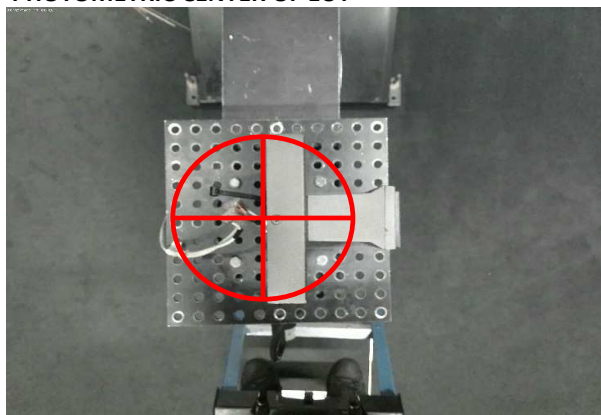
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.17	0.18	0.60
0°-180° H	90°-270° H	0°-180° V

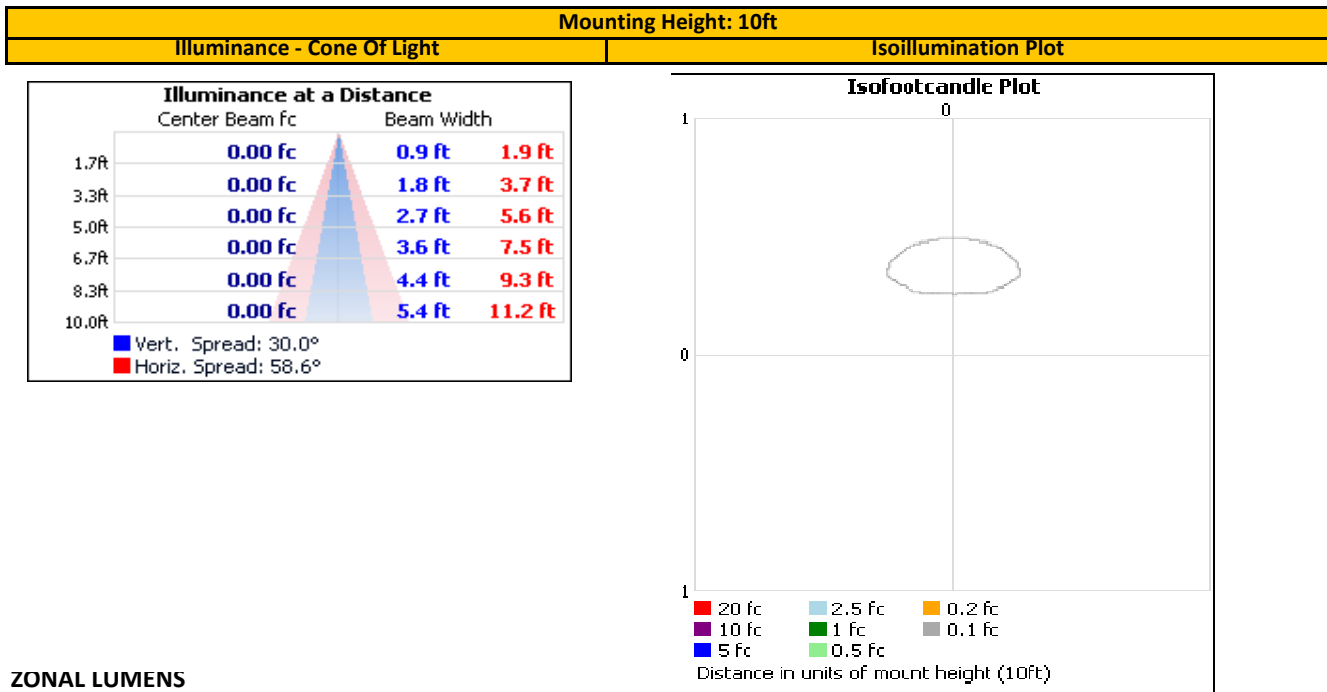
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
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Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	3.6	11.5%	90-100	2.4	7.8%
0-40	6.5	21.1%	100-110	2.4	7.8%
0-60	11.0	35.6%	110-120	2.2	7.1%
60-90	6.0	19.5%	120-130	2.0	6.3%
70-100	6.6	21.4%	130-140	1.8	5.7%
90-120	7.0	22.7%	140-150	1.6	5.2%
0-90	17.1	55.1%	150-160	1.2	3.7%
90-180	13.9	44.9%	160-170	0.4	1.3%
0-180	31.0	100.0%	170-180	0.0	0.1%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

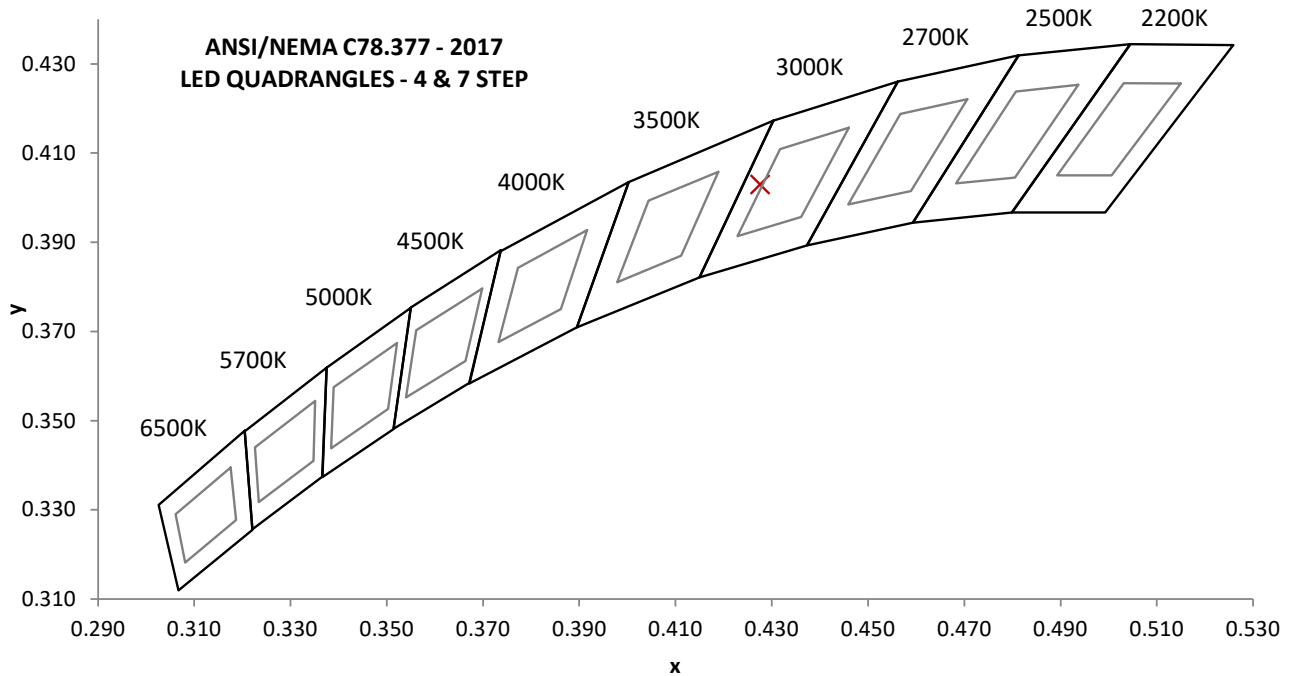
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.03	50.5	5.86	0.966	11.17

Measured at 120.03(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
38.1	6.5	3155	91.2	57.5

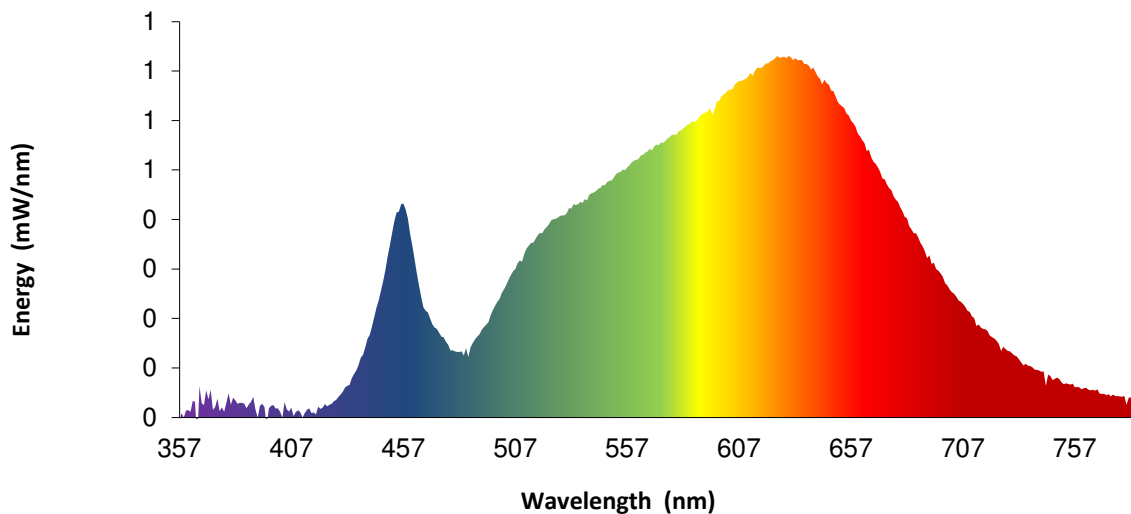
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0009	0.428	0.403	0.245	0.520



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.0		460	0.2		570	0.6		680	0.4
355	0.0		465	0.2		575	0.6		685	0.3
360	0.0		470	0.1		580	0.6		690	0.3
365	0.0		475	0.1		585	0.6		695	0.3
370	0.0		480	0.1		590	0.6		700	0.2
375	0.0		485	0.2		595	0.7		705	0.2
380	0.0		490	0.2		600	0.7		710	0.2
385	0.0		495	0.3		605	0.7		715	0.2
390	0.0		500	0.3		610	0.7		720	0.1
395	0.0		505	0.3		615	0.7		725	0.1
400	0.0		510	0.4		620	0.7		730	0.1
405	0.0		515	0.4		625	0.7		735	0.1
410	0.0		520	0.4		630	0.7		740	0.1
415	0.0		525	0.4		635	0.7		745	0.1
420	0.0		530	0.4		640	0.7		750	0.1
425	0.1		535	0.5		645	0.6		755	0.1
430	0.1		540	0.5		650	0.6		760	0.1
435	0.2		545	0.5		655	0.6		765	0.0
440	0.3		550	0.5		660	0.5		770	0.0
445	0.4		555	0.5		665	0.5		775	0.0
450	0.4		560	0.5		670	0.4		780	0.0
455	0.3		565	0.6		675	0.4		---	---



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	2M Integrating Sphere Spectrometer System	CDS 800	L244	5/24/2022	8/24/2022
2	Yokogawa Power Analyzer	WT1600	307-E475	8/27/2021	8/27/2022
3	Fluke Temperature Meter	53II	307-D587	2/16/2022	2/16/2023
4	Elgar AC Power Supply	CW1251	---	VBU	VBU
5	Sorensen DC Power Supply	XG 150-10	---	VBU	VBU
6	LSI High Speed Mirror Goniophotometer	6440	---	6/30/2022	9/30/2022
7	Elgar AC Power Supply	CW1251	---	VBU	VBU
8	Yokogawa Power Analyzer	WT210	307-E464	6/21/2022	6/21/2023
9	Traceable Hygrothermometer	4800	L204	2/21/2022	2/21/2023
10	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
11	Omega Thermometer	DPI8-C24	M263	3/1/2022	3/1/2023
12	Bosch Distance Laser	Pro GLM 20	L210	3/21/2022	3/15/2023
13	Tape Measure	Crescent	---	9/21/2021	9/21/2024
The AC power supplies used for testing have a crest factor capable of 0-3.5					

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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ANNEX A - TM-30 CALCULATIONS

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TM-30 REPORT

