

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCALDYS-LED930

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-030

ISSUE DATE

7/28/2022

REVISED DATE

None

TEST DATES

7/18/2022 through 7/26/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-030

MODEL NUMBER(s)

700BCALDYS-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

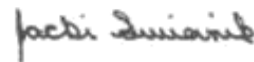
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
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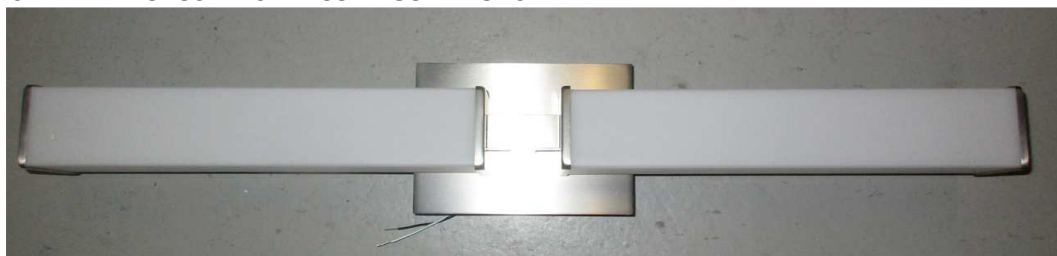
SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2206301053-030	700BCALDYS-LED930	Alden Bath	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCALDYS-LED930
Product Description:	Alden Bath
LED Model No.:	10.5W, 350mA, 30V, LED: Everlight 3030 package, 30 chips 1000 lumen, 3 step binning, CCT:3000K, 90+CRI
Driver Model No.:	LTF, DA18W440C2742-3001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1525.4	1466.4
Input Power (W) @ 120 (Vac)	15.46	15.53
Luminous Efficacy (lm/W)	98.67	94.42
Input Power Factor (I) @ 120 (Vac)	0.982	0.958

Criteria	Results
Input ATHD (%) @ 120 (Vac)	26.35
Correlated Color Temperature (K)	2989
Color Rendering Index - Ra (I)	93.1
Color Rendering Index - R9 (I)	63.7
Duv (I)	0.0000
Chromaticity Coordinate (x)	0.438
Chromaticity Coordinate (y)	0.404
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.522

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°C ± 1.2°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°C ± 1.2°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 ≥ 5x the longest luminous dimension of the EUT.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

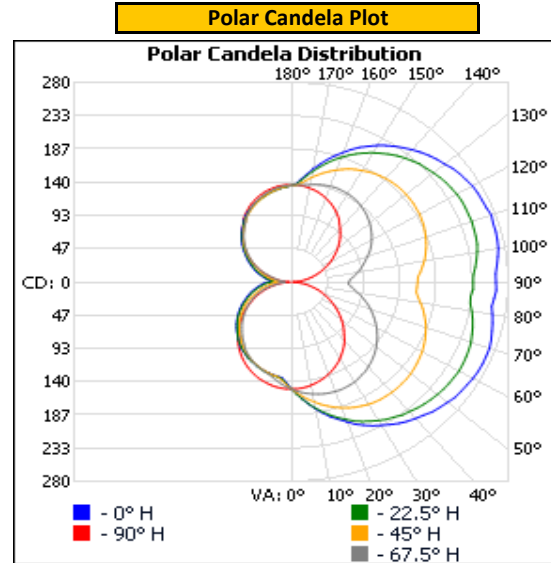
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	120.13	131.1	15.46	0.982

Light Output (lm)	Efficacy (lm/W)
1525.4	98.7

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	150	150	150	150	150
5	165	165	161	156	150
10	181	180	171	160	147
15	196	193	180	162	143
20	209	205	188	164	138
25	222	216	194	164	132
30	232	225	198	162	125
35	242	231	201	159	116
40	250	237	202	155	107
45	258	242	202	149	96
50	263	246	201	143	85
55	267	248	198	136	74
60	271	250	195	127	63
65	272	249	190	118	52
70	272	247	185	108	41
75	268	242	178	98	30
80	263	236	170	88	19
85	263	232	162	78	9
90	264	234	163	74	2
95	266	238	168	80	8
100	271	244	174	88	18
105	273	246	180	96	28
110	275	248	185	104	38
115	272	248	189	113	49
120	270	247	191	120	60
125	265	243	192	126	70
130	258	239	192	131	80
135	251	234	192	136	89
140	242	227	190	140	98
145	233	219	186	142	107
150	222	210	181	144	115
155	208	199	175	144	121
160	193	186	167	143	127
165	178	172	158	142	131
170	161	157	149	139	134
175	145	143	139	136	136
180	136	136	136	136	136

Entire luminous intensity matrix found in .IES file



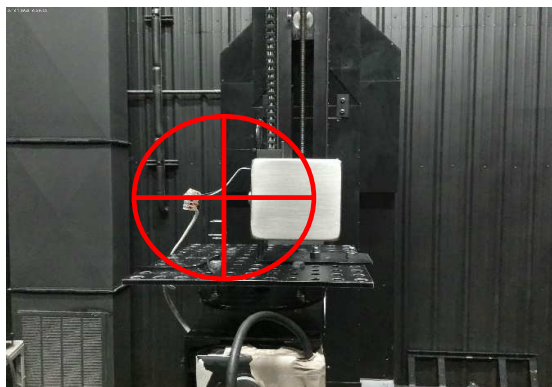
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.18	2.15	0.18
0°-180° H	90°-270° H	0°-180° V

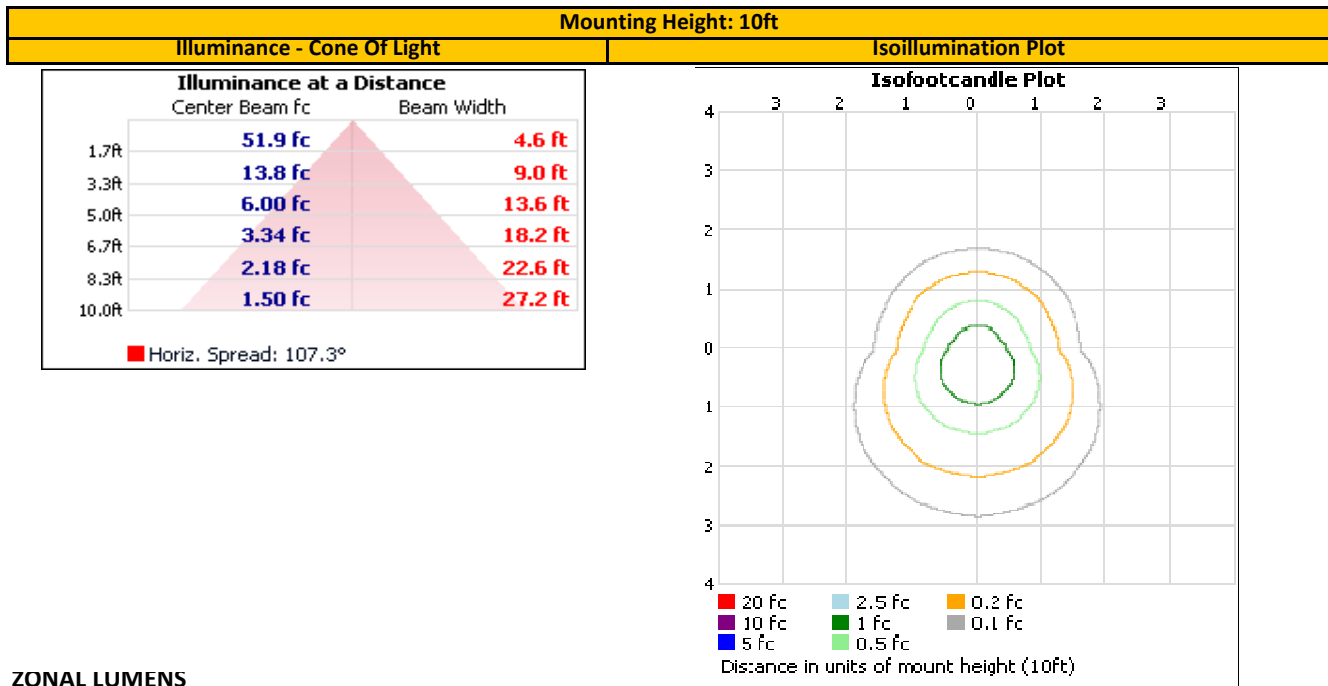
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	129.8	8.5%	90-100	95.8	6.3%
0-40	224.9	14.7%	100-110	107.1	7.0%
0-60	455.6	29.9%	110-120	113.8	7.5%
60-90	326.0	21.4%	120-130	113.3	7.4%
70-100	302.7	19.8%	130-140	104.9	6.9%
90-120	316.7	20.8%	140-150	88.9	5.8%
0-90	781.5	51.2%	150-160	66.6	4.4%
90-180	743.8	48.8%	160-170	40.2	2.6%
0-180	1,525.4	100.0%	170-180	13.1	0.9%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

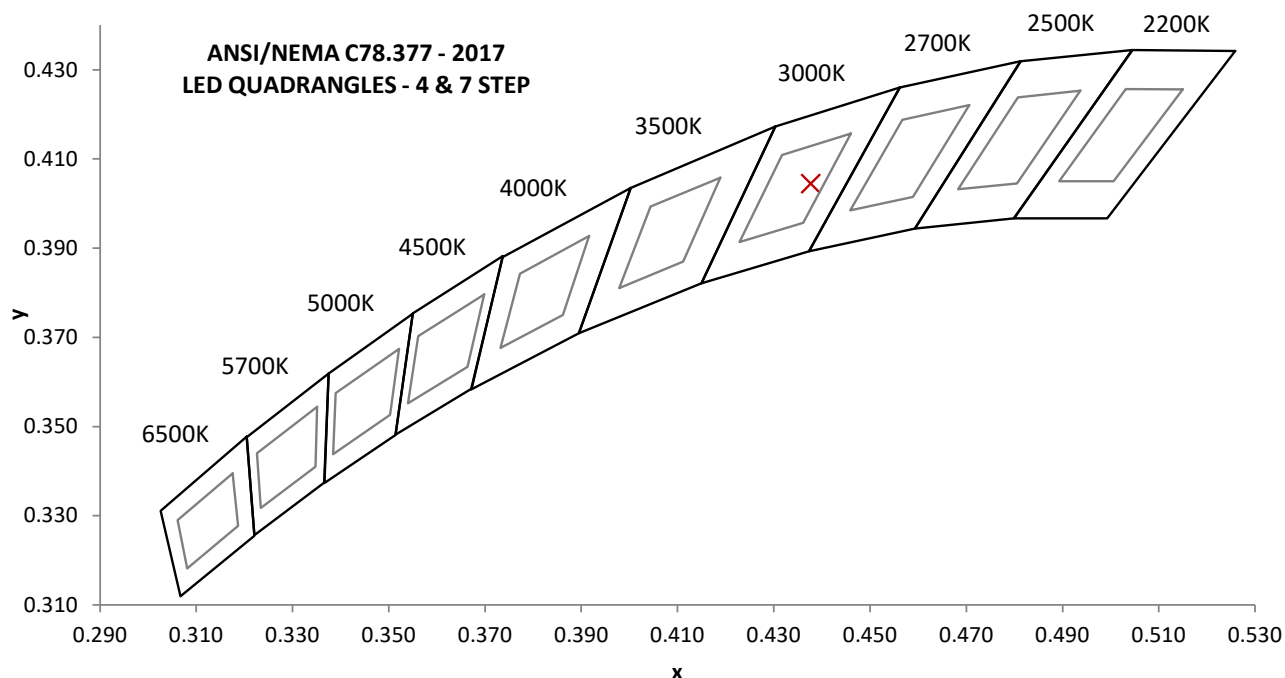
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.08	135.0	15.53	0.958	26.35

Measured at 120.08(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
1466.4	94.4	2989	93.1	63.7

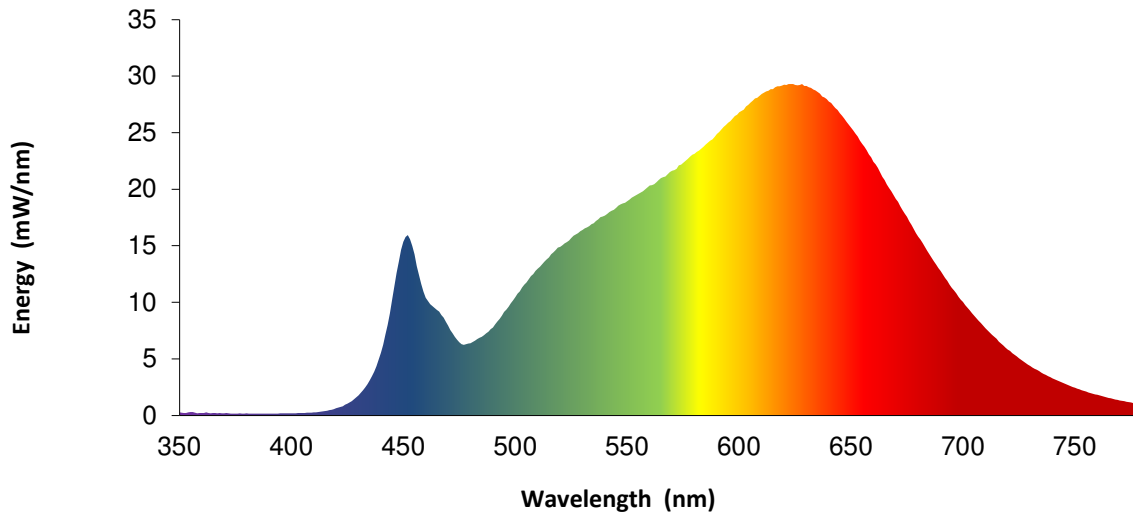
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0000	0.438	0.404	0.251	0.522



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	10.4		570	21.6		680	15.8
355	0.3		465	9.3		575	22.3		685	14.2
360	0.2		470	7.9		580	23.1		690	12.8
365	0.2		475	6.5		585	24.0		695	11.3
370	0.2		480	6.4		590	24.9		700	10.0
375	0.2		485	6.9		595	25.9		705	8.8
380	0.2		490	7.8		600	26.8		710	7.7
385	0.2		495	9.2		605	27.6		715	6.8
390	0.2		500	10.5		610	28.4		720	5.8
395	0.2		505	11.7		615	28.9		725	5.1
400	0.2		510	13.0		620	29.2		730	4.4
405	0.2		515	14.0		625	29.2		735	3.8
410	0.3		520	14.9		630	29.1		740	3.3
415	0.4		525	15.7		635	28.6		745	2.8
420	0.6		530	16.4		640	27.8		750	2.4
425	1.1		535	17.0		645	26.7		755	2.1
430	1.8		540	17.7		650	25.4		760	1.8
435	3.1		545	18.3		655	24.0		765	1.6
440	5.5		550	18.9		660	22.4		770	1.3
445	10.2		555	19.6		665	20.8		775	1.1
450	15.4		560	20.3		670	19.1		780	1.0
455	14.3		565	21.0		675	17.5		---	---



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	Elgar AC Power Supply	CW1251	---	VBU	VBU
2	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
3	Traceable Hygrothermometer	200110913	L206	2/21/2022	2/21/2023
4	Yokogawa Power Analyzer	WT1600	E462	5/21/2022	5/21/2023
5	Fluke Thermometer	53 II	D588	6/13/2022	6/13/2023
6	Fluke Multimeter	87V	M145	3/25/2022	3/25/2023
7	Current Monitor	411	A197	8/26/2021	8/26/2024
8	3M Integrating Sphere Spectrometer System	CDS 2600	L231	7/1/2022	10/1/2022
9	Fisher Scientific Stopwatch	14-649-9	N1132	3/24/2022	3/24/2023
10	LSI High Speed Mirror Goniophotometer	6440	---	6/30/2022	9/30/2022
11	Elgar AC Power Supply	CW1251	---	VBU	VBU
12	Yokogawa Power Analyzer	WT210	307-E464	6/21/2022	6/21/2023
13	Traceable Hygrothermometer	4800	L204	2/21/2022	2/21/2023
14	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
15	Omega Thermometer	DPi8-C24	M263	3/1/2022	3/1/2023
16	Bosch Distance Laser	Pro GLM 20	L210	3/21/2022	3/15/2023
17	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

