

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCBAS24S-LED927

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-022

ISSUE DATE

7/28/2022

REVISED DATE

None

TEST DATES

7/15/2022 through 7/28/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-022

MODEL NUMBER(s)

700BCBAS24S-LED927

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

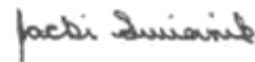
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
Staff Engineer
Lighting Division

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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2206301053-022	700BCBAS24S-LED927	Basis 24 Bath	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCBAS24S-LED927
Product Description:	Basis 24 Bath
LED Model No.:	Everlight 62-217D/HK4C-H3030QA1R32835Z15/2T 5630D package, 300mA, CRI90, CCT3000K, Bin:30K-F/30K-G, 22PCS
Driver Model No.:	LTF,DA22W600C2036BF1-00HE
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1347.8	1322.4
Input Power (W) @ 120 (Vac)	21.97	21.95
Luminous Efficacy (lm/W)	61.35	60.25
Input Power Factor (I) @ 120 (Vac)	0.983	0.981

Criteria	Results
Input ATHD (%) @ 120 (Vac)	7.12
Correlated Color Temperature (K)	2650
Color Rendering Index - Ra (I)	92.1
Color Rendering Index - R9 (I)	52.2
Duv (I)	0.0005
Chromaticity Coordinate (x)	0.465
Chromaticity Coordinate (y)	0.413
Chromaticity Coordinate (u')	0.265
Chromaticity Coordinate (v')	0.529

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

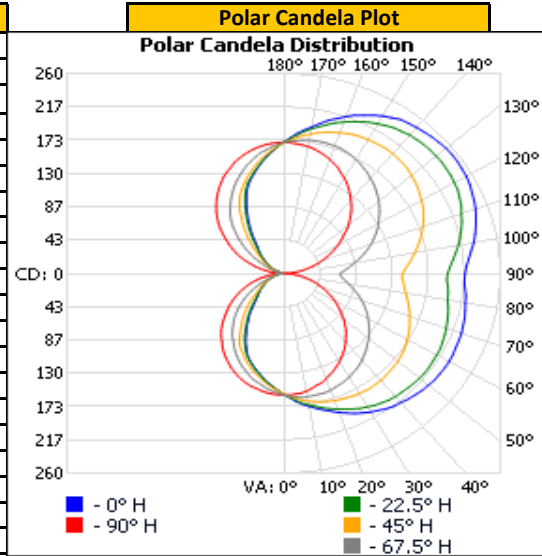
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	119.99	186.2	21.97	0.983

Light Output (lm)	Efficacy (lm/W)
1347.8	61.4

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	158	157	157	158	158
5	167	165	163	161	158
10	176	174	169	163	156
15	184	181	173	163	151
20	192	188	176	162	147
25	201	194	178	159	140
30	208	200	181	156	133
35	215	205	182	152	125
40	219	209	182	146	115
45	223	211	180	140	106
50	226	212	178	133	94
55	228	213	176	125	82
60	229	212	171	117	70
65	228	210	166	108	58
70	227	208	161	99	46
75	225	204	155	89	33
80	221	200	149	79	21
85	218	198	144	71	9
90	218	197	143	67	1
95	223	204	151	77	10
100	232	213	160	88	22
105	239	220	170	100	36
110	245	227	178	112	49
115	249	233	185	122	63
120	253	236	191	131	76
125	254	238	196	140	89
130	254	238	200	148	102
135	251	238	202	156	114
140	248	235	204	162	125
145	245	231	203	167	135
150	237	225	201	172	144
155	227	218	199	175	152
160	217	210	195	177	159
165	206	200	190	177	164
170	194	191	184	176	168
175	183	181	177	174	170
180	171	171	170	171	171

Entire luminous intensity matrix found in .IES file



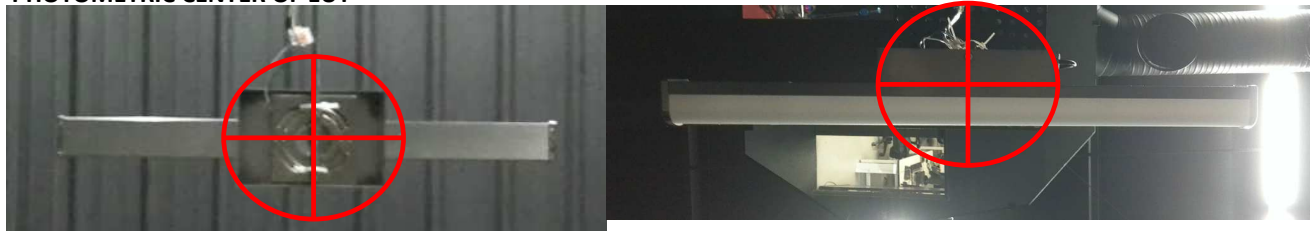
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
2.00	0.17	0.17
0°-180° H	90°-270° H	0°-180° V

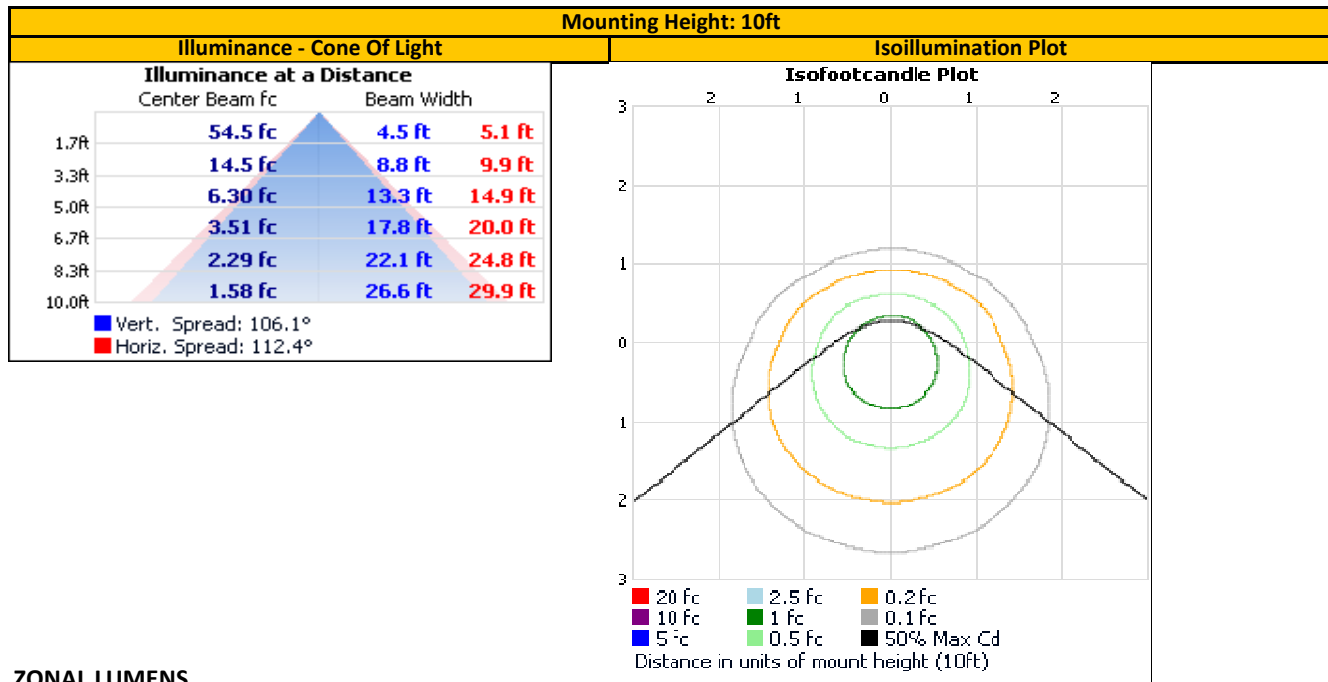
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	126.7	9.4%	90-100	76.6	5.7%
0-40	211.9	15.7%	100-110	88.0	6.5%
0-60	401.9	29.8%	110-120	98.1	7.3%
60-90	252.3	18.7%	120-130	102.7	7.6%
70-100	236.2	17.5%	130-140	100.6	7.5%
90-120	262.7	19.5%	140-150	91.2	6.8%
0-90	654.2	48.5%	150-160	73.3	5.4%
90-180	693.6	51.5%	160-170	47.0	3.5%
0-180	1,347.8	100.0%	170-180	16.2	1.2%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

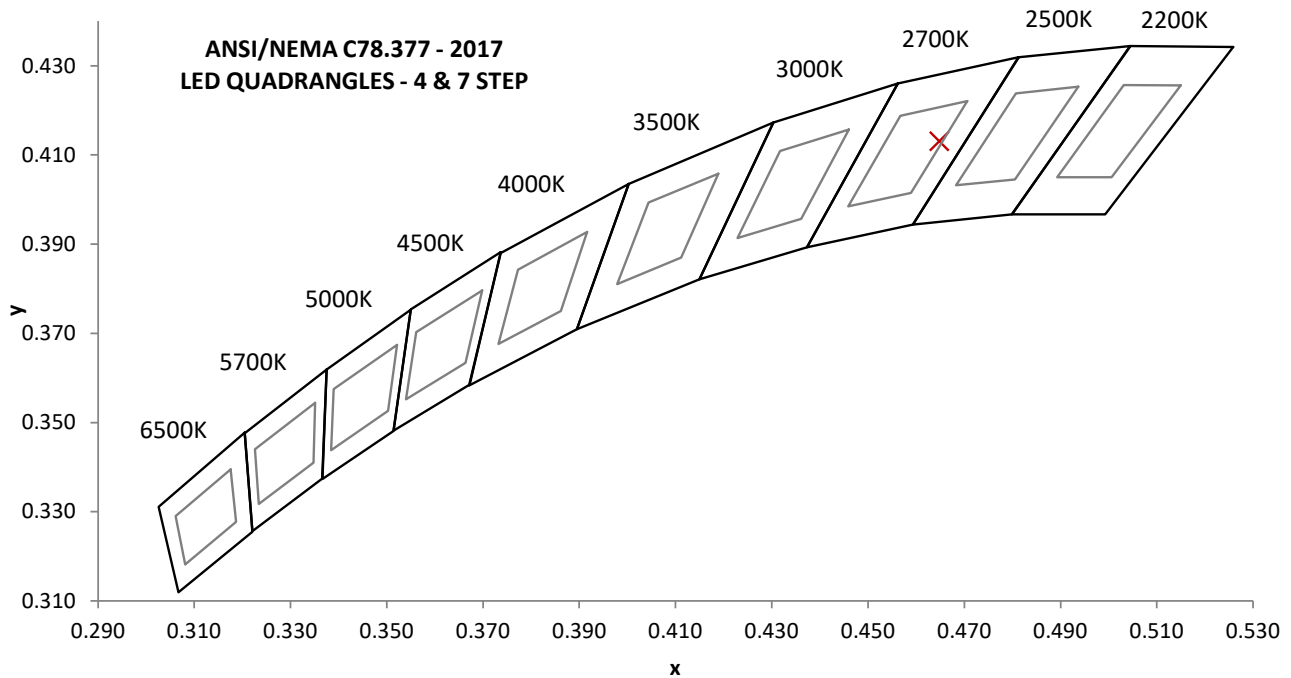
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.07	186.5	21.95	0.981	7.12

Measured at 120.07(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
1322.4	60.2	2650	92.1	52.2

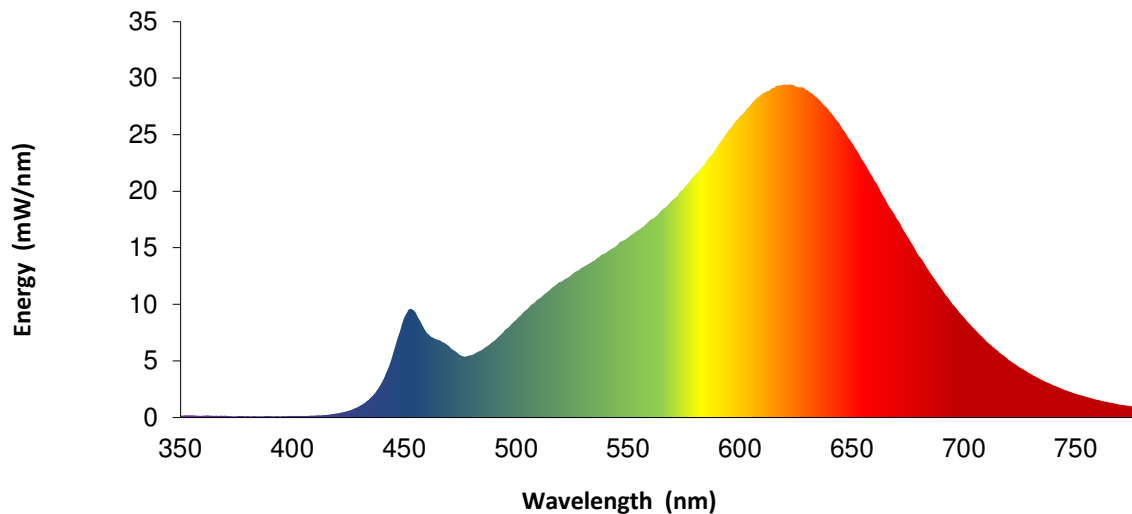
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0005	0.465	0.413	0.265	0.529



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.2		460	7.5		570	19.3		680	14.3
355	0.2		465	6.9		575	20.3		685	12.8
360	0.2		470	6.3		580	21.5		690	11.4
365	0.1		475	5.5		585	22.7		695	10.0
370	0.2		480	5.5		590	24.0		700	8.8
375	0.1		485	6.0		595	25.4		705	7.7
380	0.1		490	6.7		600	26.7		710	6.7
385	0.1		495	7.7		605	27.7		715	5.9
390	0.1		500	8.7		610	28.6		720	5.1
395	0.1		505	9.6		615	29.1		725	4.4
400	0.1		510	10.5		620	29.4		730	3.8
405	0.1		515	11.3		625	29.2		735	3.3
410	0.2		520	12.0		630	28.9		740	2.8
415	0.2		525	12.7		635	28.1		745	2.4
420	0.4		530	13.3		640	27.0		750	2.1
425	0.6		535	13.9		645	25.7		755	1.8
430	1.0		540	14.6		650	24.3		760	1.5
435	1.8		545	15.2		655	22.6		765	1.3
440	3.1		550	15.9		660	20.9		770	1.1
445	5.6		555	16.6		665	19.2		775	1.0
450	8.8		560	17.5		670	17.6		780	0.8
455	9.3		565	18.4		675	15.9		---	---



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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The graph plots Radiant Power (Equal Luminous Flux) on the y-axis against Wavelength (nm) on the x-axis. The x-axis ranges from 380 to 780 nm with major ticks every 50 nm. Two curves are shown: a black line for the 'Reference' and a red line for the 'Test'. The reference curve is a straight line sloping upwards from left to right. The test curve starts at a low value at 380 nm, rises to a small peak of approximately 0.15 at 450 nm, then rises more steeply to a broad peak of approximately 0.6 at 600 nm, before falling back to near zero at 780 nm.

