

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCSAGW25S-LED927

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-025

ISSUE DATE

7/28/2022

REVISED DATE

None

TEST DATES

7/15/2022 through 7/27/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-025

MODEL NUMBER(s)

700BCSAGW25S-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

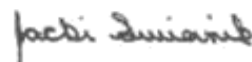
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
Staff Engineer
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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2206301053-025	700BCSAGW25S-LED927	Sage 25 Bath	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCSAGW25S-LED927
Product Description:	Sage 25 Bath
LED Model No.:	Everlight 62-217D/HK4C-H3030QA1R32835Z15/2T 5630D package, 300mA, CRI90, CCT 3000K, Bin:30K-F/30K-G, 22PCS
Driver Model No.:	LTF, DA42W1200C2036OC1-0000
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	2639.8	2503.1
Input Power (W) @ 120 (Vac)	34.40	34.49
Luminous Efficacy (lm/W)	76.73	72.58
Input Power Factor (I) @ 120 (Vac)	0.992	0.991

Criteria	Results
Input ATHD (%) @ 120 (Vac)	5.88
Correlated Color Temperature (K)	2666
Color Rendering Index - Ra (I)	93.4
Color Rendering Index - R9 (I)	57.0
Duv (I)	0.0011
Chromaticity Coordinate (x)	0.465
Chromaticity Coordinate (y)	0.415
Chromaticity Coordinate (u')	0.264
Chromaticity Coordinate (v')	0.530

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

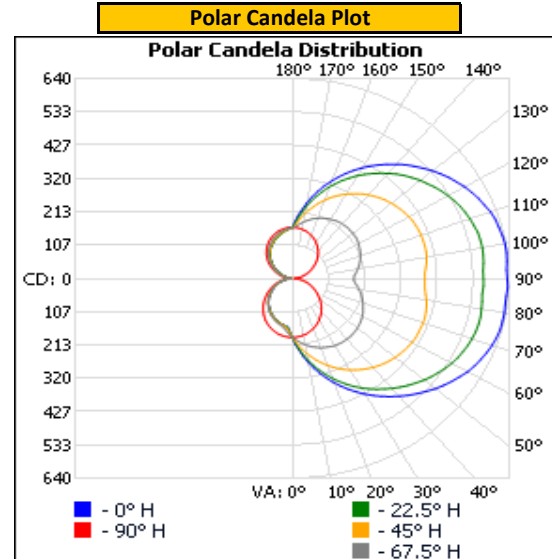
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	120.06	288.4	34.40	0.992

Light Output (lm)	Efficacy (lm/W)
2639.8	76.7

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	189	189	189	189	189
5	231	227	216	202	188
10	273	265	244	215	185
15	315	303	270	227	180
20	354	339	295	236	174
25	392	373	318	243	166
30	427	404	338	249	157
35	461	433	356	252	146
40	492	460	372	252	134
45	522	484	384	252	121
50	550	507	395	249	107
55	574	526	402	245	93
60	597	543	408	239	79
65	614	555	410	231	66
70	627	564	411	222	53
75	635	568	408	212	40
80	635	566	402	199	27
85	634	562	393	188	15
90	634	564	391	182	5
95	635	566	395	188	12
100	637	569	402	198	24
105	631	567	405	207	35
110	622	558	405	214	47
115	606	546	402	220	59
120	587	530	396	225	71
125	564	511	388	229	83
130	537	490	378	230	96
135	508	466	365	230	108
140	477	439	349	229	118
145	444	410	332	226	128
150	408	379	311	220	137
155	371	346	289	213	145
160	330	310	264	204	151
165	288	272	237	194	157
170	245	233	211	183	160
175	204	195	183	170	163
180	163	163	163	163	163

Entire luminous intensity matrix found in .IES file



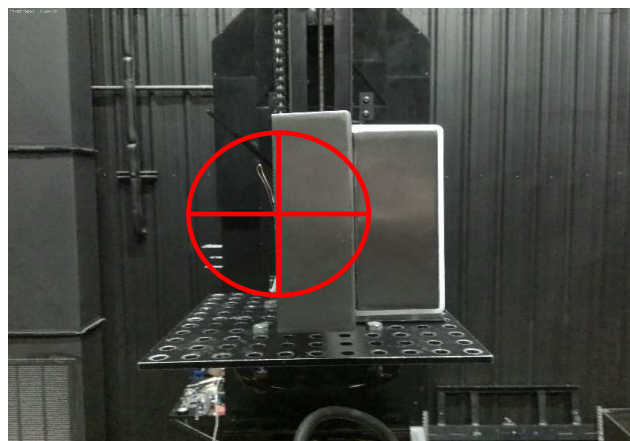
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.09	2.00	0.27
0°-180° H	90°-270° H	0°-180° V

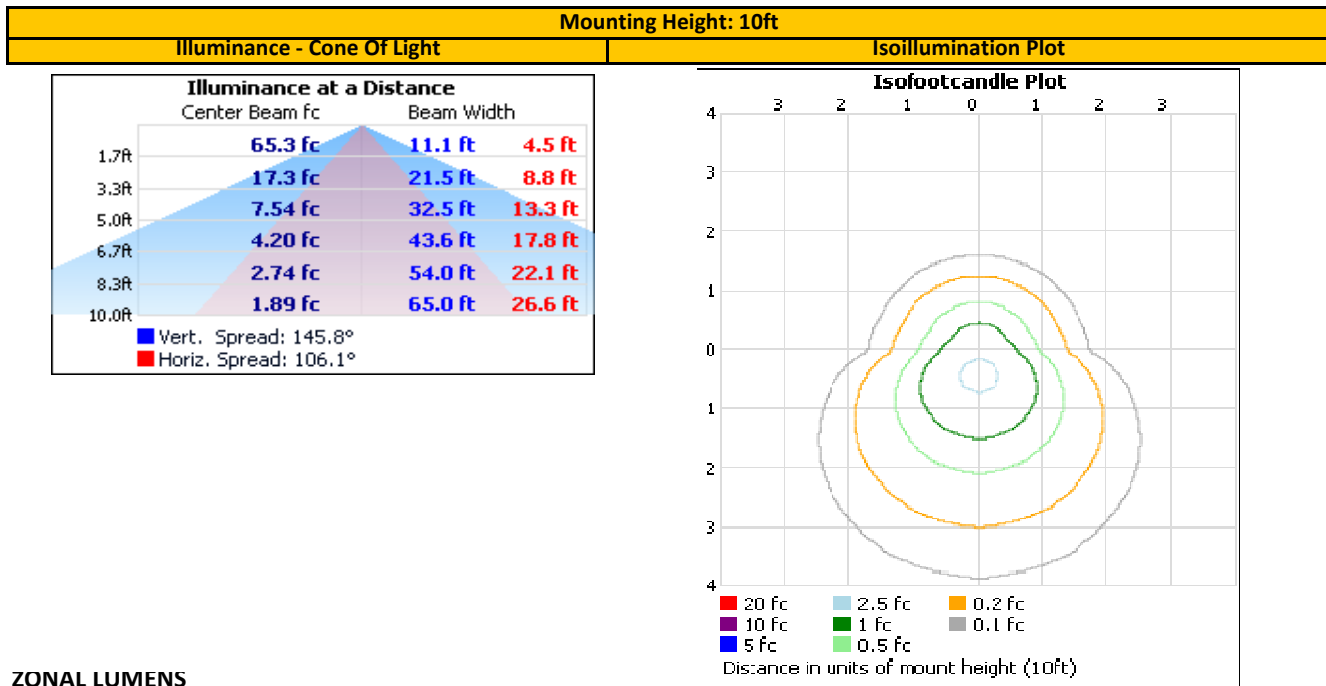
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary								
Zone			Zone					
Zone	Lumens	Luminaire	Zone	Lumens	Total	Zone	Lumens	Total
0-30	179.6	6.8%	0-10	18.4	0.7%	90-100	204.4	7.7%
0-40	323.4	12.3%	10-20	58.8	2.2%	100-110	211.9	8.0%
0-60	706.7	26.8%	20-30	102.3	3.9%	110-120	209.4	7.9%
60-90	642.6	24.3%	30-40	143.8	5.4%	120-130	195.0	7.4%
70-100	628.7	23.8%	40-50	178.9	6.8%	130-140	169.4	6.4%
90-120	625.7	23.7%	50-60	204.4	7.7%	140-150	134.9	5.1%
0-90	1,349.3	51.1%	60-70	218.3	8.3%	150-160	94.9	3.6%
90-180	1,290.5	48.9%	70-80	218.4	8.3%	160-170	54.0	2.0%
0-180	2,639.8	100.0%	80-90	206.0	7.8%	170-180	16.6	0.6%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

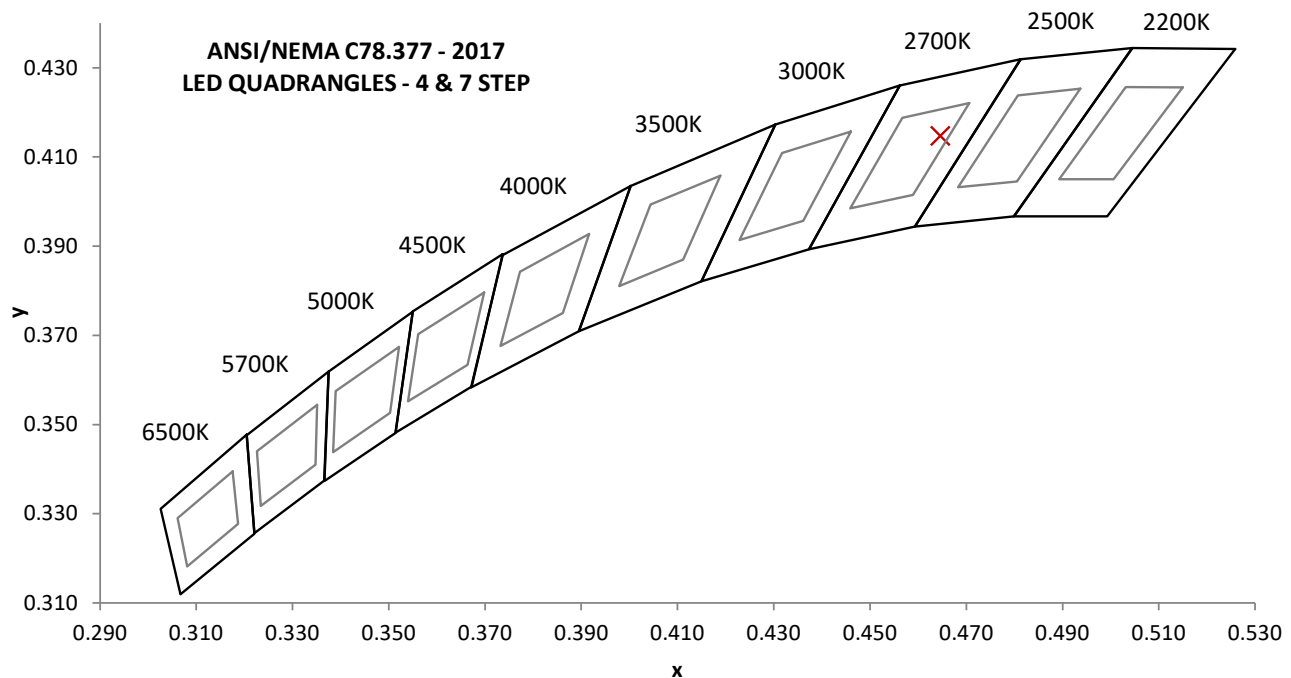
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.04	290.1	34.49	0.991	5.88

Measured at 120.04(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
2503.1	72.6	2666	93.4	57.0

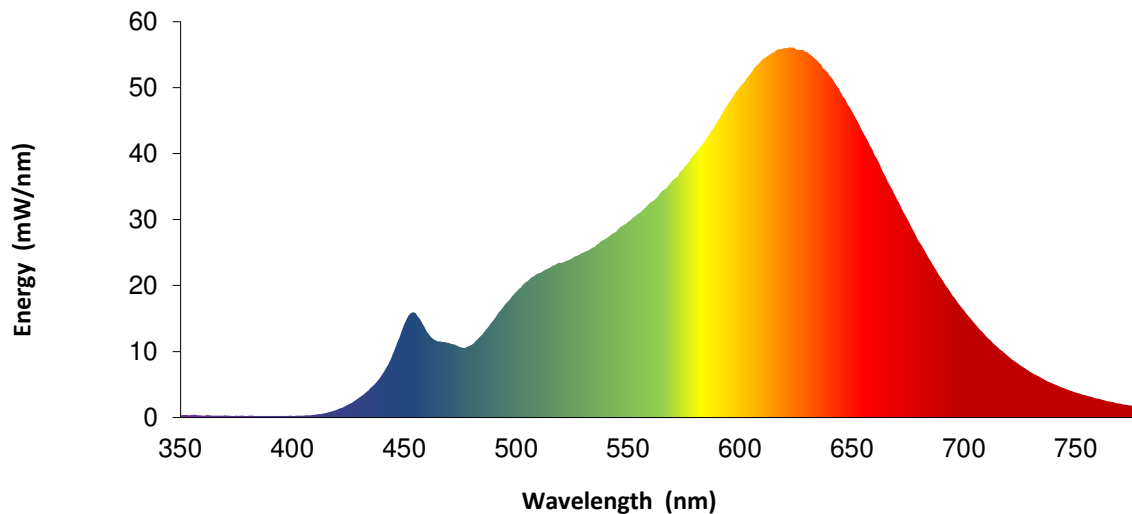
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0011	0.465	0.415	0.264	0.530



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	13.0		570	36.0		680	26.6
355	0.4		465	11.5		575	37.9		685	23.7
360	0.3		470	11.3		580	40.0		690	21.0
365	0.3		475	10.6		585	42.4		695	18.4
370	0.3		480	11.0		590	45.0		700	16.2
375	0.3		485	12.7		595	47.7		705	14.1
380	0.2		490	14.8		600	50.2		710	12.2
385	0.2		495	17.2		605	52.3		715	10.7
390	0.2		500	19.0		610	54.3		720	9.2
395	0.2		505	20.6		615	55.3		725	7.9
400	0.3		510	21.9		620	56.0		730	6.8
405	0.3		515	22.7		625	55.8		735	5.9
410	0.4		520	23.4		630	55.4		740	5.1
415	0.7		525	24.2		635	53.8		745	4.4
420	1.2		530	25.0		640	51.7		750	3.8
425	2.0		535	25.8		645	49.2		755	3.3
430	3.0		540	27.1		650	46.4		760	2.8
435	4.5		545	28.3		655	43.1		765	2.4
440	6.4		550	29.7		660	39.8		770	2.1
445	9.7		555	31.0		665	36.5		775	1.8
450	14.2		560	32.6		670	33.1		780	1.5
455	15.8		565	34.3		675	29.9		---	---



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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ANNEX A - TM-30 CALCULATIONS

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TM-30 REPORT

