

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCLUFS24S-LED930

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-014

ISSUE DATE

7/14/2022

REVISED DATE

None

TEST DATES

7/13/2022 through 7/14/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-014

MODEL NUMBER(s)

700BCLUFS24S-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

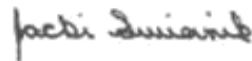
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
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	CRT2206301053-014	700BCLUFS24S-LED930	Lufe Square 24 Bath	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCLUFS24S-LED930
Product Description:	Lufe Square 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 DA25W600C2742-3001
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	2082.1	2098.4
Input Power (W) @ 120 (Vac)	23.85	23.92
Luminous Efficacy (lm/W)	87.32	87.72
Input Power Factor () @ 120 (Vac)	0.993	0.992

Criteria	Results
Input ATHD (%) @ 120 (Vac)	6.72
Correlated Color Temperature (K)	3012
Color Rendering Index - Ra ()	91.5
Color Rendering Index - R9 ()	51.6
Duv ()	0.0011
Chromaticity Coordinate (x)	0.438
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.523

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 $\geq 5\times$ the longest luminous dimension of the EUT.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

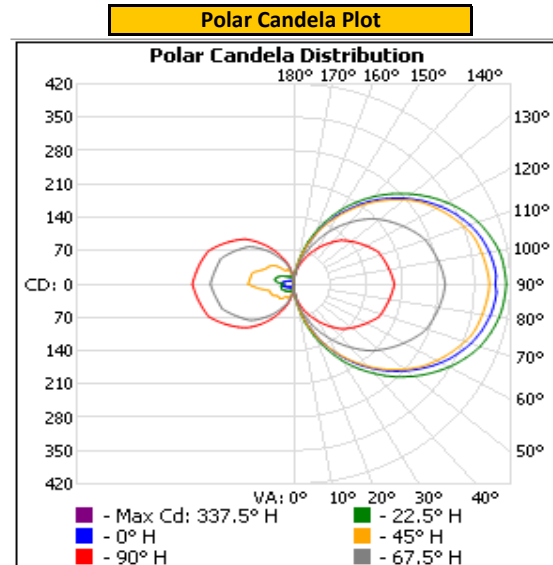
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	120.04	200.1	23.85	0.993

Light Output (lm)	Efficacy (lm/W)
2082.1	87.3

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	3	3	3	3	3
5	18	22	22	20	17
10	43	49	47	39	31
15	73	82	76	59	45
20	105	116	107	81	58
25	138	150	138	104	73
30	170	184	168	128	88
35	200	216	197	151	103
40	229	246	227	174	118
45	258	275	254	197	133
50	283	301	279	216	144
55	307	326	302	232	154
60	330	348	321	247	164
65	349	367	338	262	174
70	365	384	353	274	181
75	377	395	365	280	184
80	386	404	371	285	188
85	392	408	375	290	191
90	390	412	379	293	195
95	391	408	375	289	191
100	384	404	370	284	187
105	376	393	364	278	183
110	363	380	352	271	179
115	347	363	336	258	172
120	327	342	319	244	161
125	305	320	300	228	151
130	280	294	276	212	141
135	254	268	249	192	130
140	226	240	220	169	115
145	196	209	191	146	99
150	166	178	160	121	84
155	133	144	131	96	68
160	100	110	100	74	54
165	68	77	69	53	41
170	38	44	42	34	28
175	14	18	18	17	16
180	2	2	2	2	2

Entire luminous intensity matrix found in .IES file



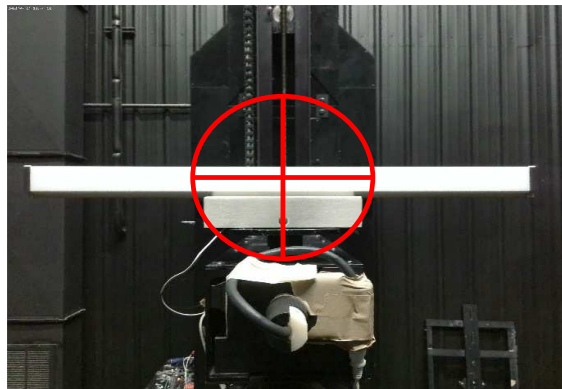
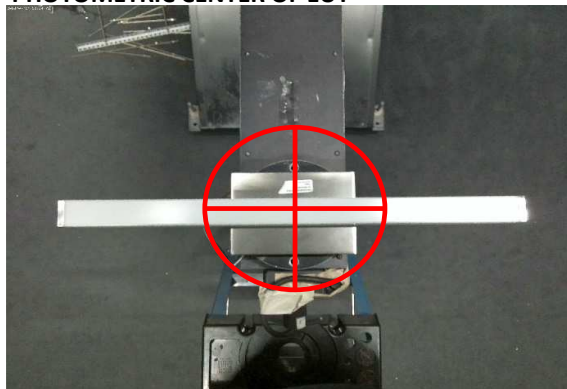
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.10	1.96	0.13
0°-180° H	90°-270° H	0°-180° V

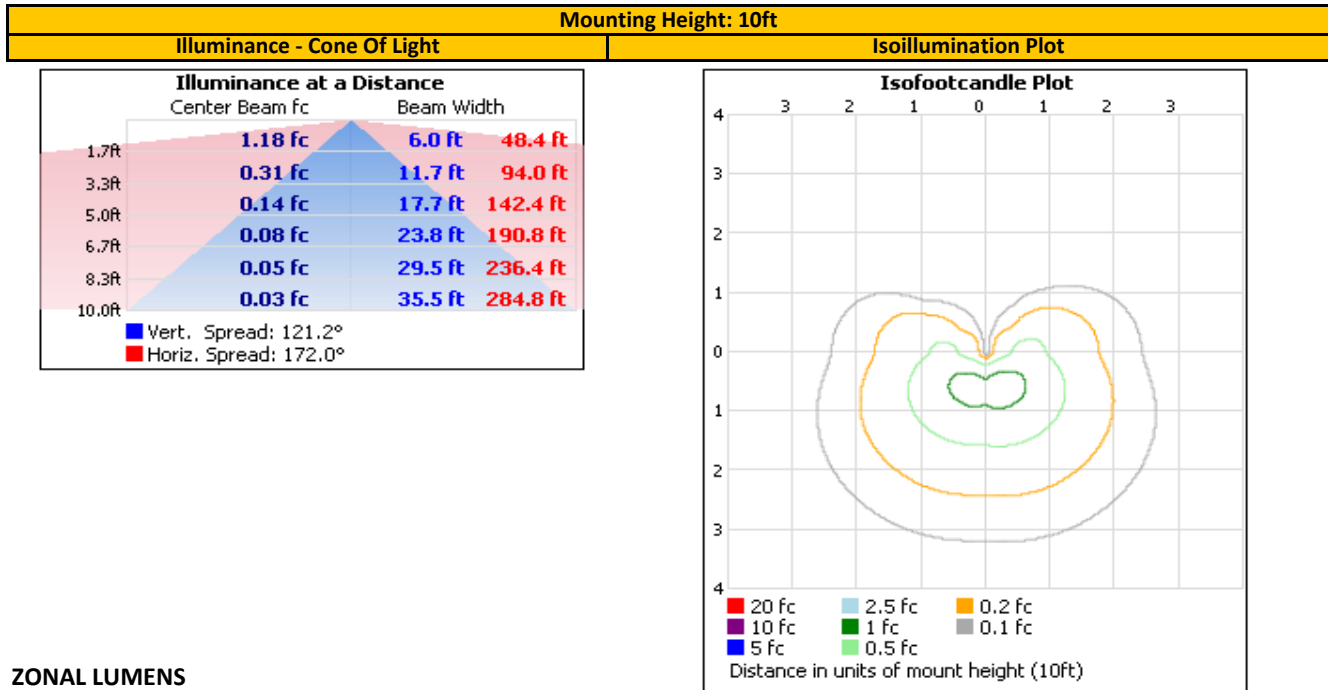
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	53.3	2.6%	90-100	236.9	11.4%
0-40	124.9	6.0%	100-110	221.2	10.6%
0-60	392.3	18.8%	110-120	192.2	9.2%
60-90	652.1	31.3%	120-130	153.5	7.4%
70-100	696.0	33.4%	130-140	112.0	5.4%
90-120	650.3	31.2%	140-150	70.5	3.4%
0-90	1,044.4	50.2%	150-160	36.4	1.7%
90-180	1,037.7	49.8%	160-170	13.3	0.6%
0-180	2,082.1	100.0%	170-180	1.8	0.1%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

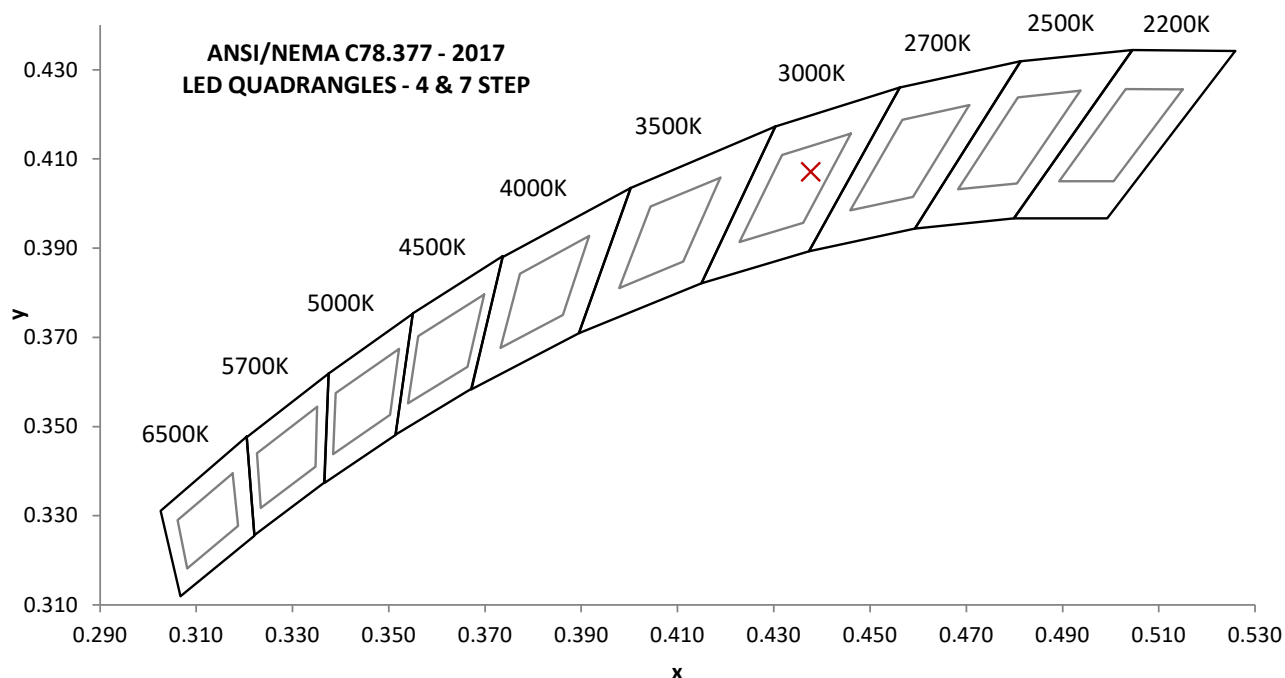
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.00	200.9	23.92	0.992	6.72

Measured at 120(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
2098.4	87.7	3012	91.5	51.6

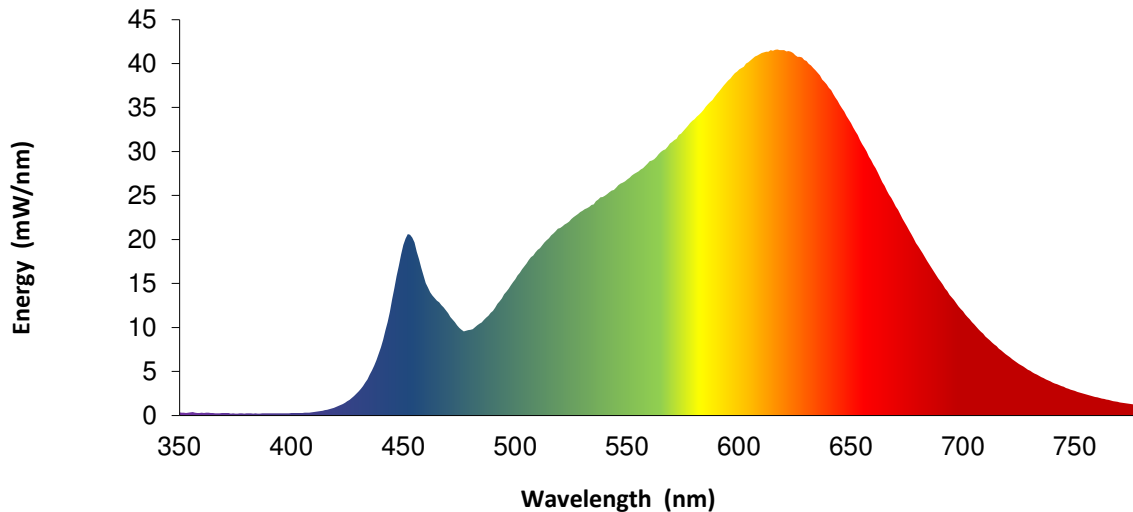
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0011	0.438	0.407	0.250	0.523



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	15.0		570	31.1		680	19.2
355	0.3		465	13.1		575	32.3		685	17.1
360	0.3		470	11.6		580	33.7		690	15.2
365	0.3		475	9.9		585	35.1		695	13.4
370	0.3		480	9.7		590	36.6		700	11.8
375	0.2		485	10.6		595	38.1		705	10.3
380	0.3		490	11.9		600	39.4		710	9.0
385	0.2		495	13.8		605	40.4		715	7.9
390	0.2		500	15.5		610	41.2		720	6.8
395	0.3		505	17.3		615	41.5		725	5.9
400	0.3		510	18.8		620	41.5		730	5.1
405	0.3		515	20.1		625	40.9		735	4.4
410	0.4		520	21.3		630	40.3		740	3.8
415	0.6		525	22.3		635	39.0		745	3.2
420	1.0		530	23.3		640	37.2		750	2.8
425	1.6		535	24.0		645	35.3		755	2.4
430	2.7		540	25.0		650	33.2		760	2.1
435	4.6		545	25.9		655	30.8		765	1.8
440	7.8		550	26.8		660	28.5		770	1.5
445	13.2		555	27.7		665	26.1		775	1.3
450	19.4		560	28.9		670	23.7		780	1.1
455	19.7		565	30.0		675	21.5		---	---



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	Current Monitor	411	A197	8/26/2021	8/26/2024
7	3M Integrating Sphere Spectrometer System	CDS 2600	L231	7/1/2022	10/1/2022
8	LSI High Speed Mirror Goniophotometer	6440	---	6/30/2022	9/30/2022
9	Elgar AC Power Supply	CW1251	---	VBU	VBU
10	Yokogawa Power Analyzer	WT210	307-E464	6/21/2022	6/21/2023
11	Traceable Hygrothermometer	4800	L204	2/21/2022	2/21/2023
12	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
13	Omega Thermometer	DPi8-C24	M263	3/1/2022	3/1/2023
14	Bosch Distance Laser	Pro GLM 20	L210	3/21/2022	3/15/2023
15	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

