

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCLUFS48S-LED930

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-016

ISSUE DATE

7/28/2022

REVISED DATE

None

TEST DATES

7/14/2022 through 7/23/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-016

MODEL NUMBER(s)

700BCLUFS48S-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

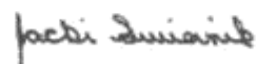
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

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	CRT2206301053-016	700BCLUFS48S-LED930	Lufe Square 48 Bath	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCLUFS48S-LED930
Product Description:	Lufe Square 48 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)	4317.8	4206.6
Input Power (W) @ 120 (Vac)	44.73	44.77
Luminous Efficacy (lm/W)	96.52	93.96
Input Power Factor () @ 120 (Vac)	0.990	0.988

Criteria	Results
Input ATHD (%) @ 120 (Vac)	8.29
Correlated Color Temperature (K)	2992
Color Rendering Index - Ra ()	93.0
Color Rendering Index - R9 ()	59.2
Duv ()	-0.0015
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.400
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.519

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No

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

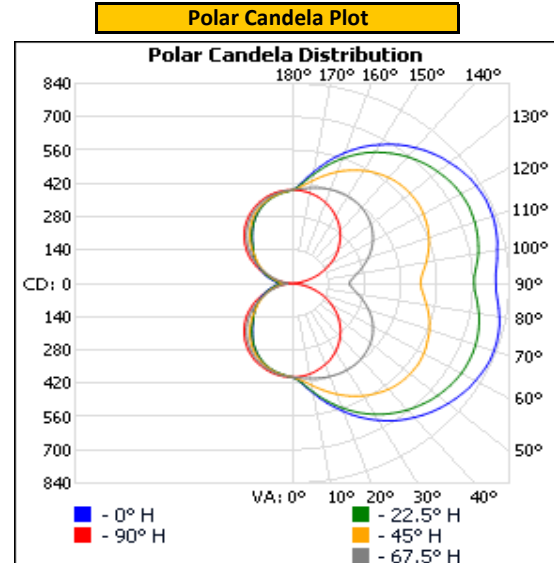
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	120.16	376.3	44.73	0.990

Light Output (lm)	Efficacy (lm/W)
4317.8	96.5

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	394	394	394	394	394
5	421	420	409	399	392
10	469	462	434	405	387
15	521	510	465	411	377
20	571	556	495	417	365
25	620	598	522	420	351
30	664	635	546	421	333
35	704	667	564	420	312
40	735	694	580	414	288
45	764	716	590	405	263
50	786	734	594	394	236
55	805	747	594	379	206
60	818	756	588	361	175
65	828	757	577	339	142
70	830	755	566	313	109
75	826	747	548	286	74
80	814	734	528	259	43
85	797	716	509	234	16
90	788	704	496	221	3
95	793	713	507	234	15
100	805	731	528	258	42
105	818	743	546	284	73
110	826	752	563	312	107
115	828	756	576	338	141
120	822	754	586	360	173
125	810	746	592	379	206
130	792	733	592	395	234
135	771	717	589	408	262
140	744	695	581	417	288
145	712	668	567	423	311
150	673	637	548	426	332
155	632	600	525	425	350
160	583	558	498	421	365
165	530	512	468	415	378
170	477	465	437	408	386
175	426	421	410	400	391
180	393	393	393	393	393

Entire luminous intensity matrix found in .IES file



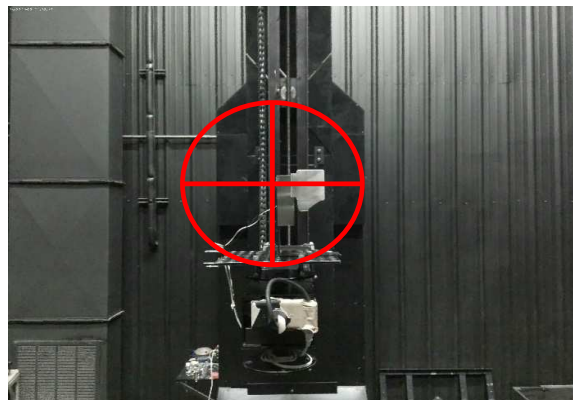
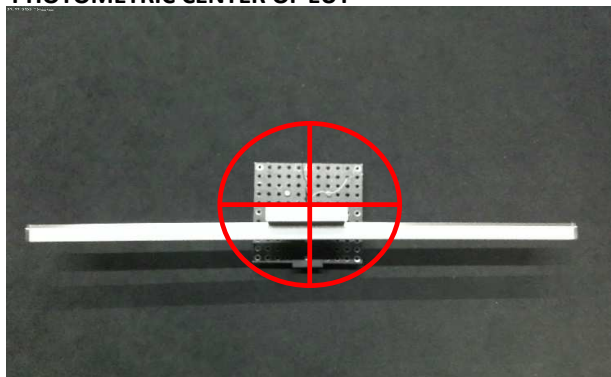
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.10	3.96	0.13
0°-180° H	90°-270° H	0°-180° V

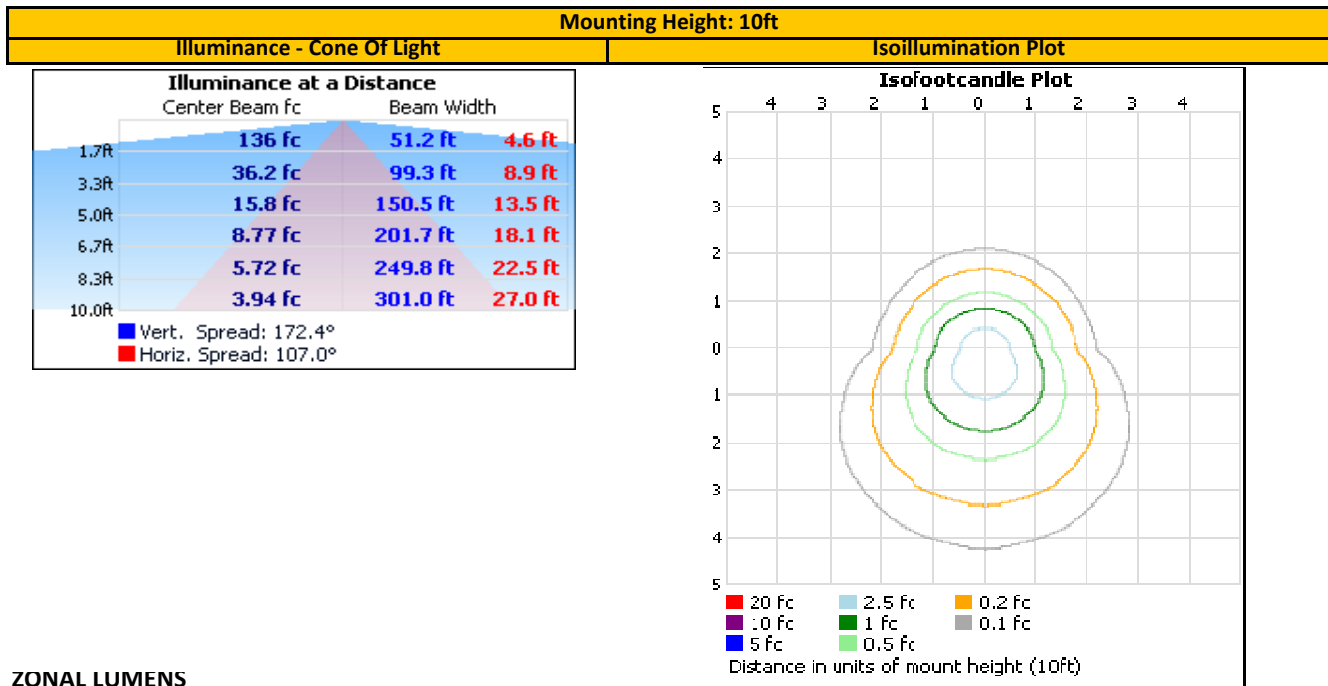
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary								
Zone 1			Zone 2					
Zone	Lumens	Luminaire	Zone	Lumens	Total	Zone	Lumens	Total
0-30	349.5	8.1%	0-10	38.3	0.9%	90-100	277.0	6.4%
0-40	608.3	14.1%	10-20	117.2	2.7%	100-110	308.2	7.1%
0-60	1,242.0	28.8%	20-30	194.0	4.5%	110-120	329.6	7.6%
60-90	916.5	21.2%	30-40	258.8	6.0%	120-130	329.5	7.6%
70-100	863.5	20.0%	40-50	304.6	7.1%	130-140	305.2	7.1%
90-120	914.8	21.2%	50-60	329.1	7.6%	140-150	259.5	6.0%
0-90	2,158.4	50.0%	60-70	329.9	7.6%	150-160	194.7	4.5%
90-180	2,159.3	50.0%	70-80	309.2	7.2%	160-170	117.5	2.7%
0-180	4,317.8	100.0%	80-90	277.4	6.4%	170-180	38.3	0.9%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

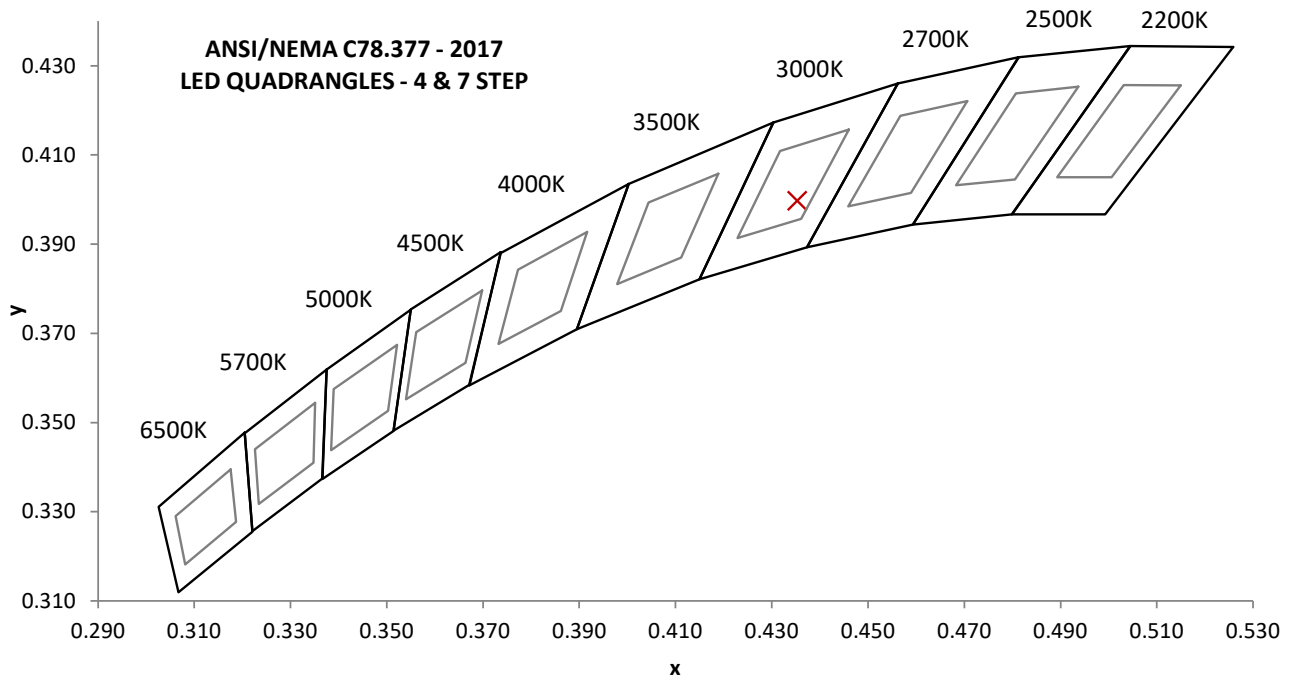
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.04	377.3	44.77	0.988	8.29

Measured at 120.04(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
4206.6	94.0	2992	93.0	59.2

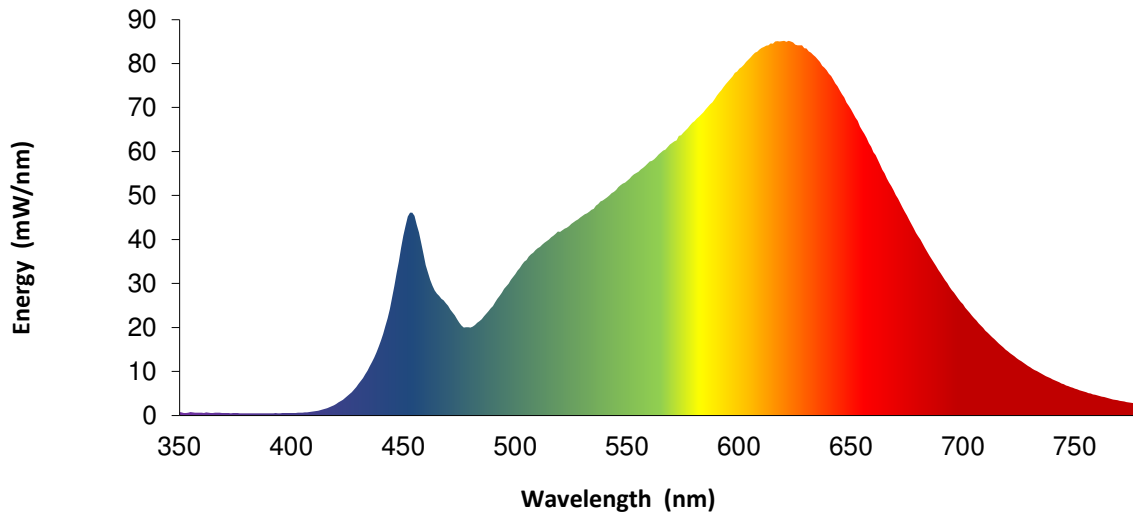
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0015	0.435	0.400	0.251	0.519



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.8		460	34.2		570	62.0		680	40.7
355	0.8		465	27.7		575	64.3		685	36.4
360	0.7		470	24.9		580	66.9		690	32.4
365	0.6		475	21.1		585	69.6		695	28.5
370	0.6		480	20.0		590	72.7		700	25.3
375	0.6		485	21.9		595	75.9		705	22.1
380	0.5		490	24.9		600	78.8		710	19.3
385	0.5		495	28.8		605	81.4		715	16.9
390	0.5		500	32.2		610	83.5		720	14.6
395	0.5		505	35.4		615	84.5		725	12.7
400	0.6		510	38.0		620	85.2		730	11.0
405	0.7		515	40.0		625	84.3		735	9.5
410	0.9		520	41.7		630	83.4		740	8.2
415	1.5		525	43.6		635	80.9		745	7.1
420	2.6		530	45.4		640	77.7		750	6.1
425	4.4		535	47.0		645	73.9		755	5.3
430	7.2		540	49.2		650	69.6		760	4.6
435	11.2		545	51.3		655	64.8		765	3.9
440	17.0		550	53.4		660	59.9		770	3.4
445	26.8		555	55.4		665	55.1		775	2.9
450	40.8		560	57.7		670	50.1		780	2.5
455	45.4		565	59.8		675	45.5		---	---



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

