

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700STR30FS-LED927

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-029

ISSUE DATE

7/28/2022

REVISED DATE

None

TEST DATES

7/18/2022 through 7/28/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-029

MODEL NUMBER(s)

700STR30FS-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

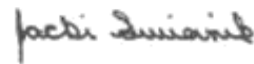
ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2206301053-029	700STR30FS-LED927	Stratos 30 Chandelier	Production	6/30/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700STR30FS-LED927
Product Description:	Stratos 30 Chandelier
LED Model No.:	Luminus3030 package ,33 chips ,CCT:2700K,90+CRI;
Driver Model No.:	ERP, ESP050W-1200-42
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	2729.1	2867.8
Input Power (W) @ 120 (Vac)	43.83	43.87
Luminous Efficacy (lm/W)	62.27	65.37
Input Power Factor (I) @ 120 (Vac)	0.988	0.986

Criteria	Results
Input ATHD (%) @ 120 (Vac)	11.38
Correlated Color Temperature (K)	2728
Color Rendering Index - Ra (I)	93.6
Color Rendering Index - R9 (I)	67.0
Duv (I)	0.0012
Chromaticity Coordinate (x)	0.460
Chromaticity Coordinate (y)	0.414
Chromaticity Coordinate (u')	0.261
Chromaticity Coordinate (v')	0.528

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

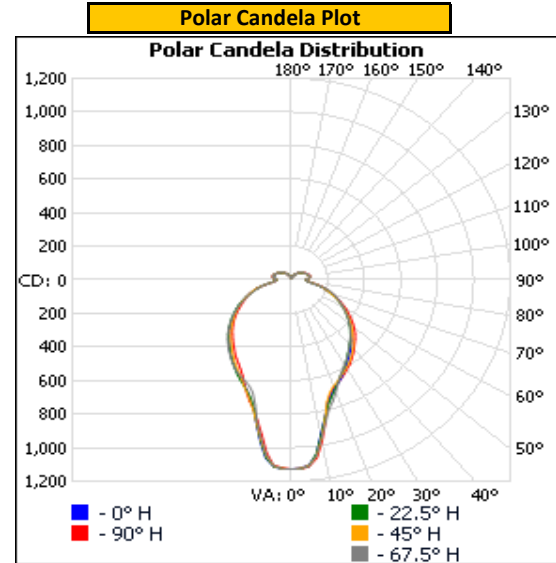
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.07	369.6	43.83	0.988

Light Output (lm)	Efficacy (lm/W)
2729.1	62.3

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	1127	1127	1127	1127	1127
5	1106	1111	1109	1113	1116
10	932	940	956	956	973
15	765	775	752	798	764
20	690	696	674	713	682
25	646	635	636	632	648
30	600	587	603	583	612
35	552	538	567	540	575
40	508	497	526	496	534
45	464	457	476	457	495
50	422	418	430	416	450
55	380	372	382	373	399
60	333	326	333	328	348
65	284	278	279	286	293
70	231	228	227	246	238
75	180	184	179	199	188
80	119	123	126	126	134
85	90	91	92	92	93
90	79	79	80	80	81
95	91	91	90	89	88
100	101	100	102	104	104
105	101	99	102	102	102
110	96	94	94	95	98
115	88	87	87	90	91
120	80	79	81	82	83
125	73	72	75	76	76
130	66	65	69	69	69
135	59	58	61	62	62
140	52	52	54	55	55
145	45	45	45	47	47
150	36	36	37	37	37
155	29	30	30	30	30
160	24	24	24	24	24
165	18	18	18	19	19
170	15	14	15	15	16
175	10	10	11	11	11
180	9	9	9	9	9

Entire luminous intensity matrix found in .IES file



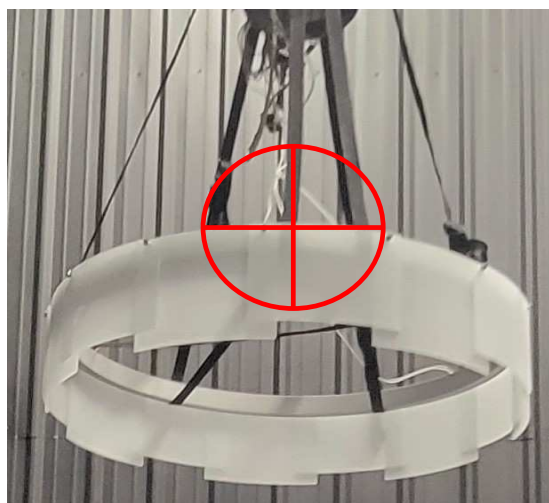
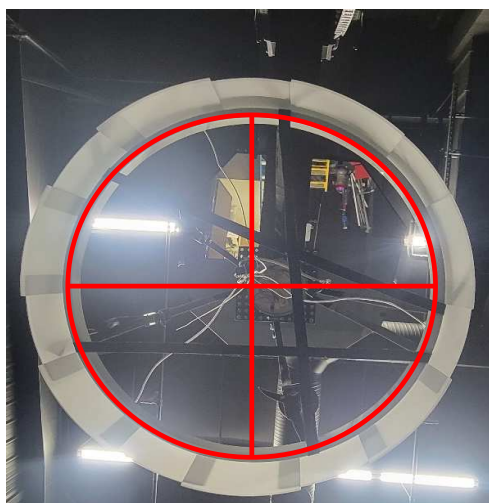
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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
-2.54	-2.54	0.00
0°-180° H	90°-270° H	0°-180° V

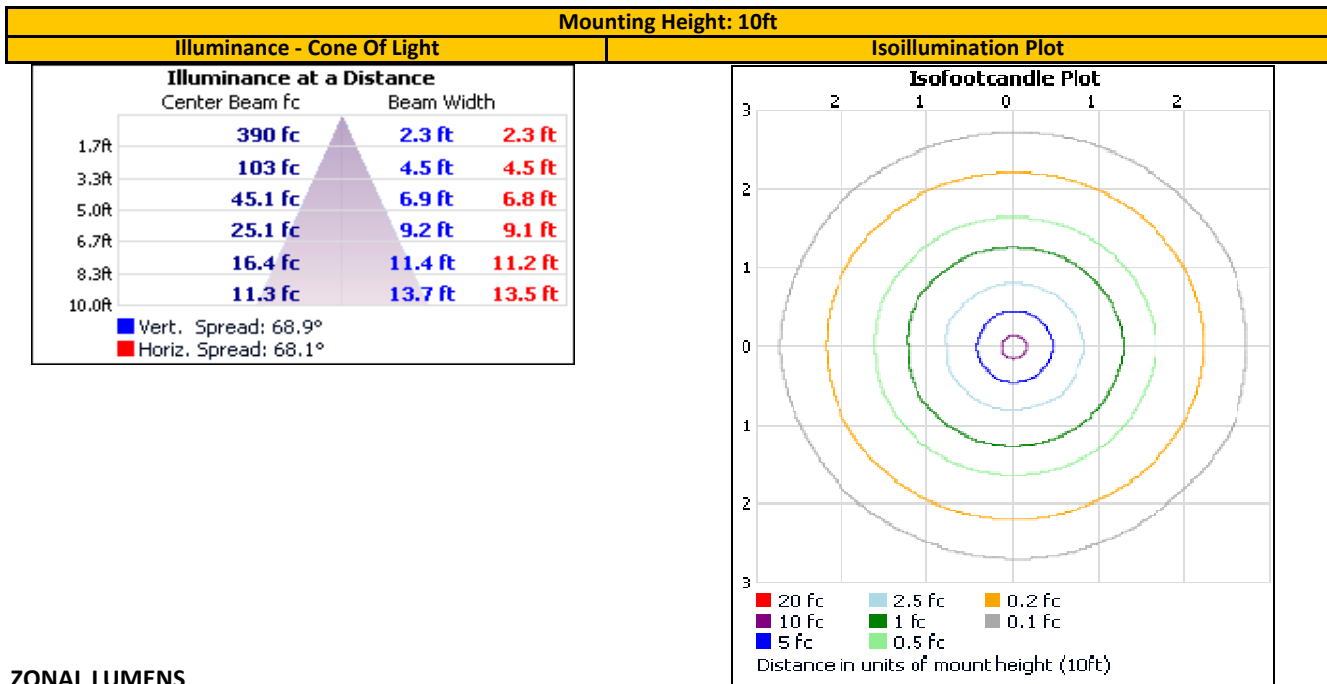
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	622.3	22.8%	90-100	96.9	3.5%
0-40	972.9	35.6%	100-110	106.2	3.9%
0-60	1,684.7	61.7%	110-120	88.3	3.2%
60-90	588.8	21.6%	120-130	67.3	2.5%
70-100	399.7	14.6%	130-140	47.0	1.7%
90-120	291.4	10.7%	140-150	28.8	1.1%
0-90	2,273.5	83.3%	150-160	14.2	0.5%
90-180	455.6	16.7%	160-170	5.6	0.2%
0-180	2,729.1	100.0%	170-180	1.2	0.0%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

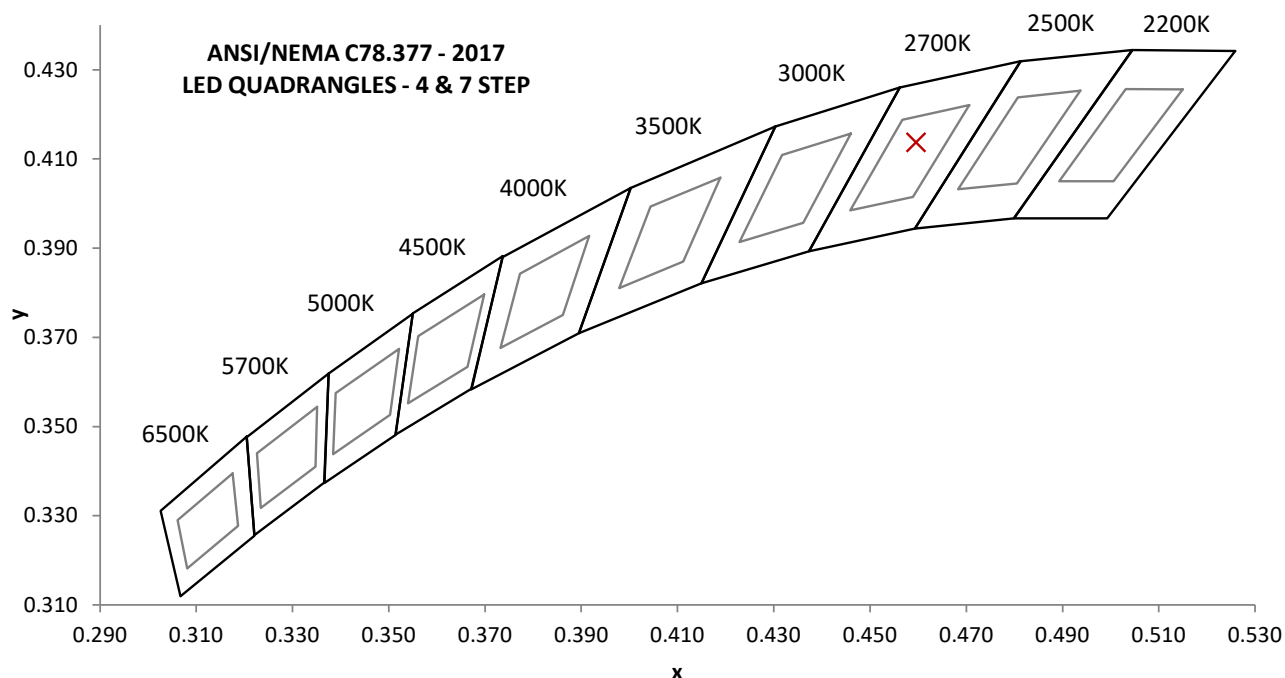
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.08	370.5	43.87	0.986	11.38

Measured at 120.08(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
2867.8	65.4	2728	93.6	67.0

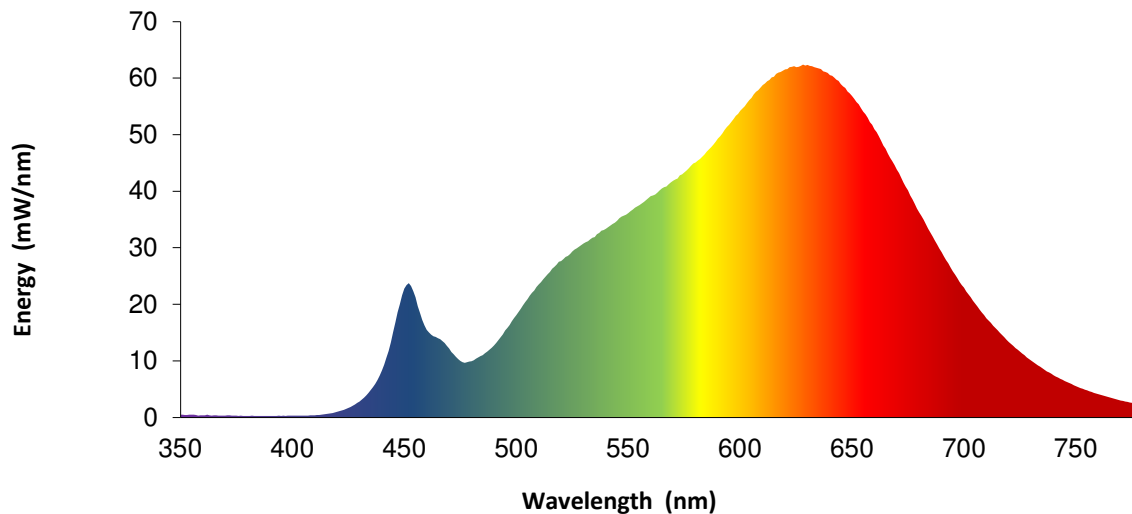
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0012	0.460	0.414	0.261	0.528



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.5		460	15.5		570	41.8		680	36.2
355	0.5		465	14.0		575	43.3		685	32.7
360	0.4		470	12.2		580	45.1		690	29.3
365	0.4		475	10.0		585	47.0		695	25.9
370	0.3		480	9.9		590	49.3		700	22.9
375	0.3		485	11.0		595	51.8		705	20.1
380	0.3		490	12.7		600	54.3		710	17.5
385	0.3		495	15.4		605	56.5		715	15.4
390	0.3		500	18.1		610	58.7		720	13.4
395	0.3		505	20.9		615	60.2		725	11.6
400	0.3		510	23.5		620	61.5		730	10.1
405	0.3		515	25.7		625	61.9		735	8.7
410	0.4		520	27.7		630	62.3		740	7.5
415	0.6		525	29.3		635	61.7		745	6.5
420	1.0		530	30.8		640	60.5		750	5.5
425	1.7		535	31.9		645	59.0		755	4.8
430	2.8		540	33.4		650	56.9		760	4.1
435	4.9		545	34.8		655	54.1		765	3.5
440	8.3		550	36.2		660	51.0		770	3.0
445	15.1		555	37.6		665	47.5		775	2.6
450	22.8		560	39.1		670	43.8		780	2.2
455	21.3		565	40.5		675	40.1		---	---



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

