

VISUAL COMFORT & COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700**OBLP**-LED930

PROJECT NUMBER

G104349704

REPORT NUMBER

104349704CHI-008

ISSUE DATE

8/24/2020

REVISED DATE

None

TEST DATES

08/15/2020 through 08/19/2020.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104349704CHI-008

MODEL NUMBER(s)

700**OBLP**-LED930

REPORT RENDERED TO:

VISUAL COMFORT & COMPANY
7400 LINDER AVE
SKOKIE, IL 60077

STATEMENT OF LIMITATION

NVLAP Lab Code 600186-0. 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-01080748-1.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

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

In Charge of Testing:



Ian Smith
Engineer
Lighting Division

Reviewer:



Jeff Davis
NA Technical Lead
Lighting Division

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SAMPLE INFORMATION

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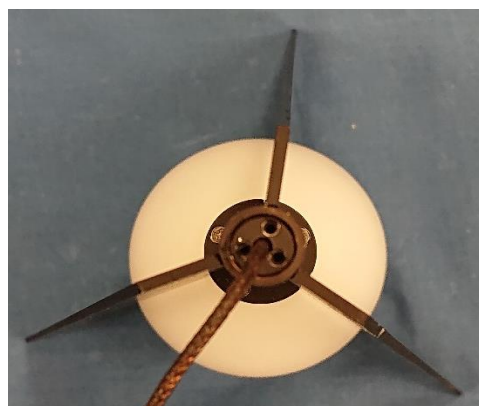
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH08062020034718-008	700**OBLP**-LED930	MINI ORBEL PYRAMID PENDANT	Production	8/6/2020

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	700**OBLP**-LED930	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700**OBLP**-LED930
Product Description:	MINI ORBEL PYRAMID PENDANT
LED Model No.:	LUMINUS CXM-6-30-90-36-AC40
Driver Model No.:	LTF DL18W200C40R-0000
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	633.5	663.1
Input Power (W) @ 12VAC (Vac)	9.05	9.09
Lumen Efficacy (lm/W)	70.0	73.0
Input Power Factor (I) @ 12VAC (Vac)	0.910	0.908

Criteria	Results
Input ATHD (%) @ 12VAC (Vac)	37.73
Correlated Color Temperature (K)	3049
Color Rendering Index - Ra (I)	91.7
Color Rendering Index - R9 (I)	61.2
Duv (I)	0.0020
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.409
Chromaticity Coordinate (u')	0.248
Chromaticity Coordinate (v')	0.523

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. 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 was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

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 was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	700**OBLP**-LED930	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

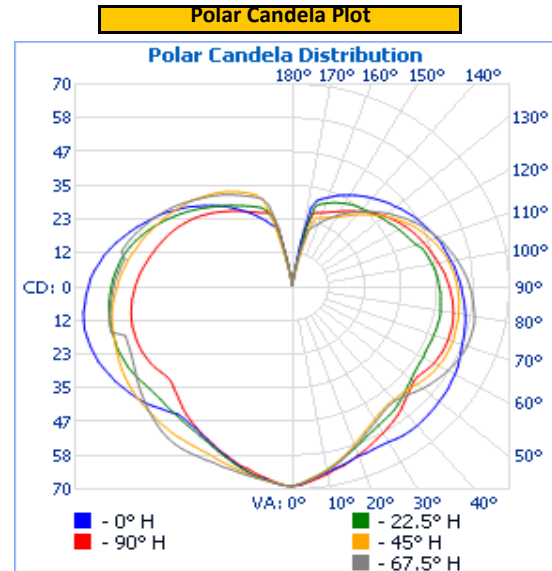
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	12.0	828.0	9.05	0.910

Light Output (lm)	Lumen Efficacy (lm/W)
633.5	70.0

INTENSITY SUMMARY - CANDELA

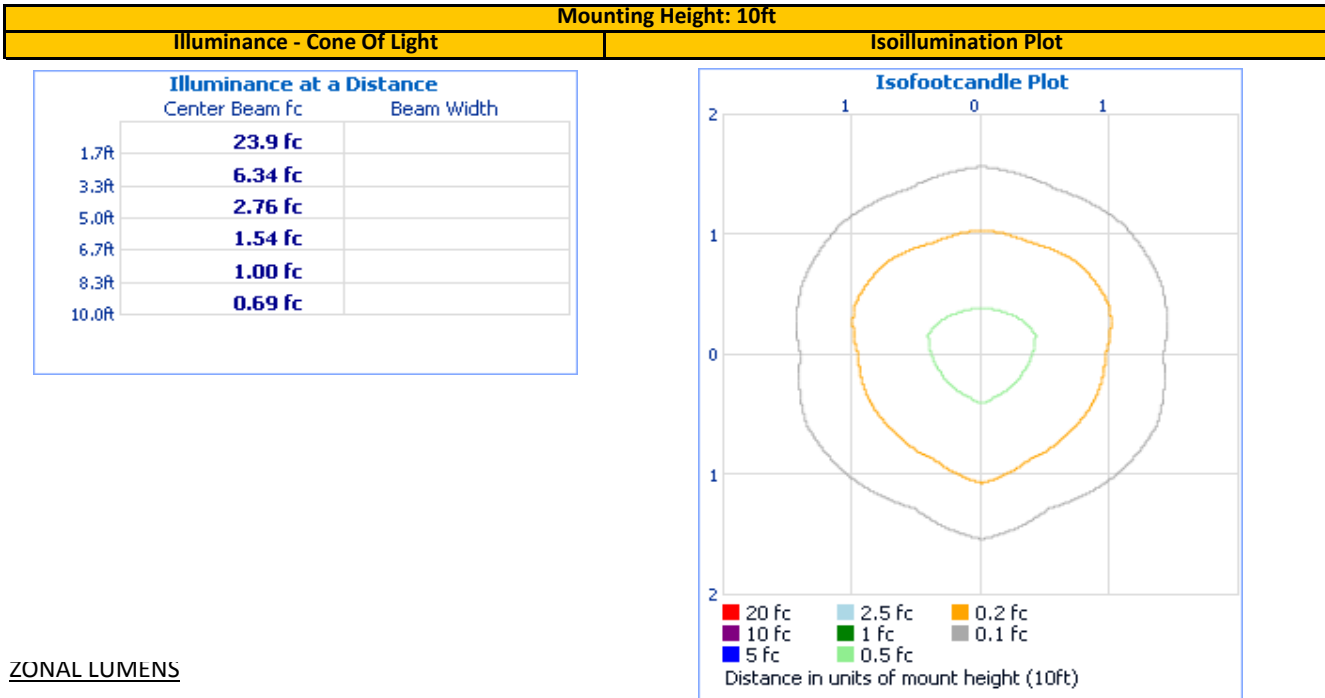
Angle	0	22.5	45	67.5	90
0	69	69	69	69	69
5	67	67	67	67	68
10	65	64	64	65	66
15	64	62	61	62	64
20	62	59	58	59	62
25	62	57	55	56	60
30	62	56	53	54	58
35	63	54	52	52	57
40	63	53	51	52	55
45	62	52	51	53	53
50	62	50	52	55	51
55	61	49	54	56	52
60	61	49	54	58	53
65	60	48	55	59	53
70	58	49	55	60	54
75	58	49	55	60	53
80	57	49	54	60	53
85	56	48	54	59	52
90	54	47	53	57	51
95	53	47	52	56	49
100	52	46	51	54	48
105	51	45	50	52	46
110	50	42	48	50	45
115	48	41	46	47	44
120	47	40	43	45	42
125	45	38	41	42	40
130	43	37	38	40	38
135	42	36	35	37	36
140	40	35	32	34	34
145	38	34	30	31	32
150	37	33	28	28	30
155	35	32	26	26	28
160	33	31	25	23	27
165	31	29	20	20	26
170	15	8	3	7	10
175	1	1	2	1	1
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	52.2	8.2%	90-100	58.8	9.3%
0-40	88.6	14.0%	100-110	54.0	8.5%
0-60	183.7	29.0%	110-120	46.9	7.4%
60-90	178.7	28.2%	120-130	38.7	6.1%
70-100	180.7	28.5%	130-140	30.0	4.7%
90-120	159.7	25.2%	140-150	21.7	3.4%
0-90	362.4	57.2%	150-160	14.2	2.2%
90-180	271.1	42.8%	160-170	6.6	1.0%
0-180	633.5	100.0%	170-180	0.3	0.0%

INTEGRATING SPHERE TESTING

REPORT NO. 104349704CHI-008

Test Configuration	Tested Model No.	Pass/Fail/NA
1	700**OBLP**-LED930	NA

PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

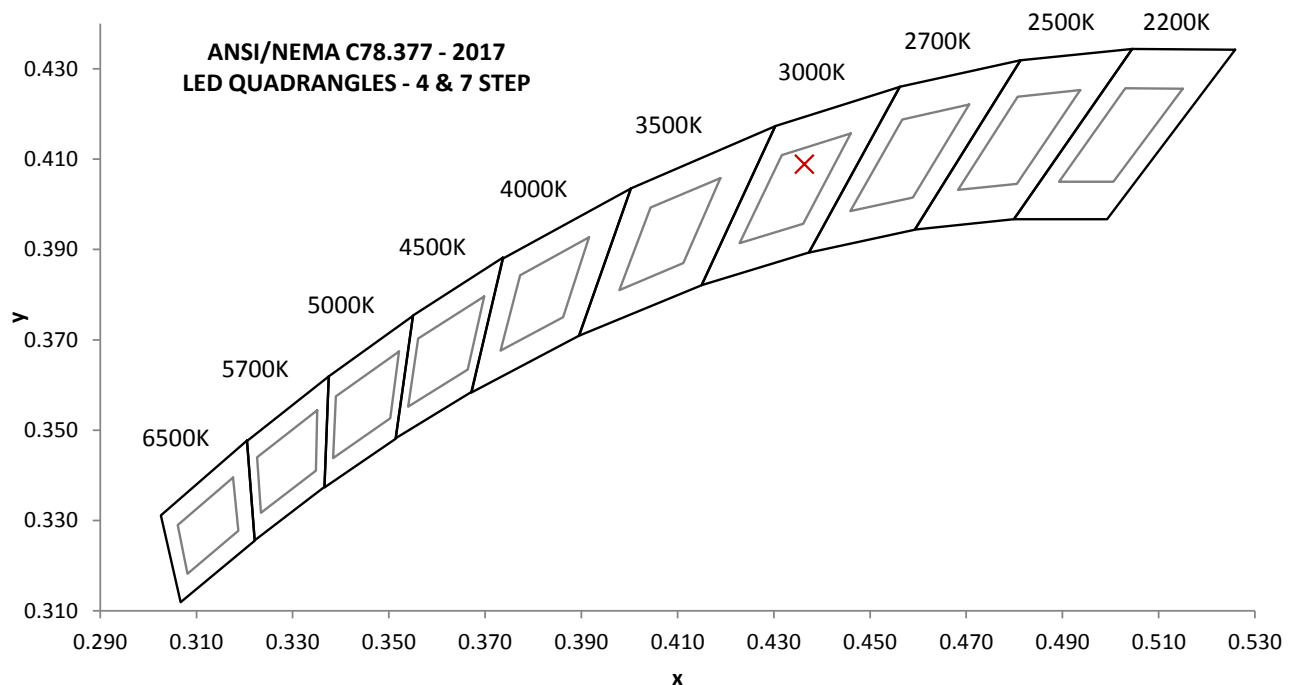
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()	Input ATHD (%)
12.01	833.9	9.09	0.908	37.73

Measured at 12.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra ()	CRI - R9 ()
663.1	73.0	3049	91.7	61.2

Duv ()	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0020	0.436	0.409	0.248	0.523

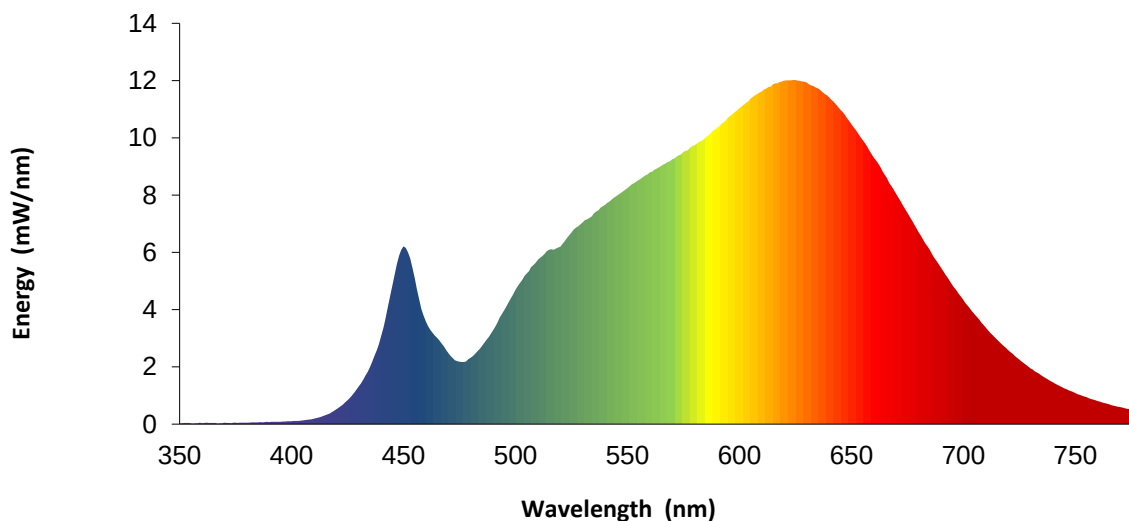


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.0		460	3.6		570	9.3		680	6.7
355	0.0		465	3.0		575	9.5		685	6.1
360	0.0		470	2.5		580	9.7		690	5.5
365	0.0		475	2.2		585	10.0		695	4.9
370	0.1		480	2.3		590	10.3		700	4.3
375	0.1		485	2.7		595	10.7		705	3.8
380	0.1		490	3.3		600	11.0		710	3.4
385	0.1		495	4.0		605	11.4		715	3.0
390	0.1		500	4.7		610	11.6		720	2.6
395	0.1		505	5.3		615	11.9		725	2.3
400	0.1		510	5.7		620	12.0		730	2.0
405	0.1		515	6.1		625	12.0		735	1.7
410	0.2		520	6.2		630	11.9		740	1.5
415	0.3		525	6.7		635	11.7		745	1.3
420	0.5		530	7.0		640	11.4		750	1.1
425	0.8		535	7.4		645	11.0		755	0.9
430	1.3		540	7.7		650	10.5		760	0.8
435	2.0		545	8.0		655	9.9		765	0.7
440	3.1		550	8.2		660	9.3		770	0.6
445	4.8		555	8.5		665	8.7		775	0.5
450	6.2		560	8.8		670	8.0		780	0.4
455	5.1		565	9.0		675	7.4		---	---

Without correction of sample absorption.



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	Yokogawa Power Meter	WT210	146919	7/1/2020	7/1/2021
2	Omega Thermometer	DPI8-C24	146920	10/3/2019	10/3/2020
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	146957	12/2/2019	12/2/2020
5	Elgar, AC Power Supply	CW1251	146111	VBU	VBU
6	Newport Humidity Recorder	iServer	CHI0456	10/11/2019	10/11/2020
7	Labsphere Spectroradiometer	CDS2600	CHI0539	VBU	VBU
8	3 Meter Sphere	SPR600	CHI0088	VBU	VBU
9	Elgar AC Power Supply	CW1251	146112	VBU	VBU
10	Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
11	Yokogawa Power Meter	WT1600	146769	4/6/2020	4/6/2021
12	Extech K Temperature Meter	421502	CHI0476	10/1/2019	10/1/2020
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Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
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