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SONNEMAN - A WAY OF LIGHT

TEST REPORT

SCOPE OF WORK
LED Performance Testing

MODEL NUMBER
2390

PROJECT NUMBER
G104119984

REPORT NUMBER
104119984CRT-008

REPORT ISSUE DATE
October 21, 2019

REPORT REVISION DATE
None

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FOR THE SCOPE OF
ACCREDITATION UNDER NVLAP LAB
CODE 100402-0.

REPORT NUMBER
104119984CRT-008

TEST OF (1) MICRO TUBE LED PENDANT

MODEL NUMBER
2390

REPORT RENDERED TO:
SONNEMAN - A WAY OF LIGHT
151 AIRPORT DRIVE
WAPPINGERS FALLS, NY 12590
USA

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-01007713.

TEST STANDARDS

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

TEST DATES

October 18, 2019

In Charge Of Tests:

Gerald Gray
Associate Engineer
Lighting Division

Report Reviewed By:

Melanie Brittain
Associate Engineer
Lighting Division

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REPORT NO.: 104119984CRT-008
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SAMPLE INFORMATION

Control No.	Model No.	Description	Type	Received
CRT19101609-002	2390	Micro Tube LED Pendant	Production	10/16/2019

SAMPLE PHOTOS

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SUMMARY OF DATA

Product Model No.:	2390
Product Description:	Micro Tube LED Pendant
LED Model No.:	Not Provided
Driver Model No.:	ERP EBR010U-0200-42
Light Source:	LED

Criteria	Results
Light Output (lumens)	332.8
Input Power (W) @ 120 (Vac)	8.02
Lumen Efficacy (lm/W)	41.5
Input Power Factor () @ 120 (Vac)	0.989

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

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

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD

A Type C Mirror Goniometer was used to measure the intensity (candela) at each angle of distribution for the SSL sample.

Ambient temperature was measured equal to the height of the sample mounted on the goniometer equipment. The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was allowed to stabilize for at least thirty minutes before measurements were made. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

The calibration of the goniometer-photometer system is traceable to the National Institute of Standards and Technology.

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

Fixture Model No.	2390	Fixture Control No.	CRT19101609-002

Test Notes:	N/A

Base Orientation
Up

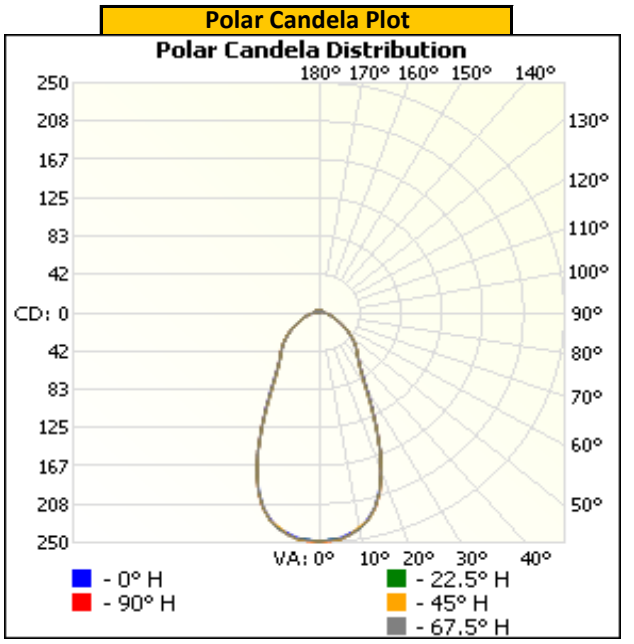
Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
120.01	67.6	8.02	0.989

Light Output (lm)	Lumen Efficacy (lm/W)
332.8	41.5

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	249	249	249	249	249
5	246	247	247	247	247
10	238	238	236	238	238
15	219	220	220	219	220
20	184	185	185	185	185
25	139	138	138	138	139
30	98	97	96	96	98
35	73	73	72	72	73
40	61	61	61	61	61
45	53	53	53	53	53
50	45	45	45	45	45
55	37	37	37	37	37
60	29	29	29	29	29
65	22	22	22	22	22
70	17	17	17	17	17
75	13	13	13	13	13
80	10	10	10	10	10
85	8	8	8	8	8
90	6	6	5	5	5
95	5	5	5	5	5
100	4	4	4	4	4
105	4	4	4	4	4
110	4	4	4	4	4
115	4	4	4	4	4
120	4	4	4	4	4
125	4	4	4	4	4
130	3	3	3	3	3
135	3	3	3	3	3
140	3	3	3	3	3
145	1	2	2	2	2
150	2	2	2	2	2
155	1	2	0	2	1
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Polar Candela Plot



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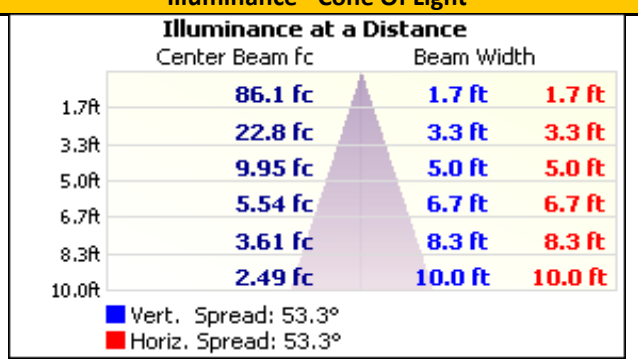
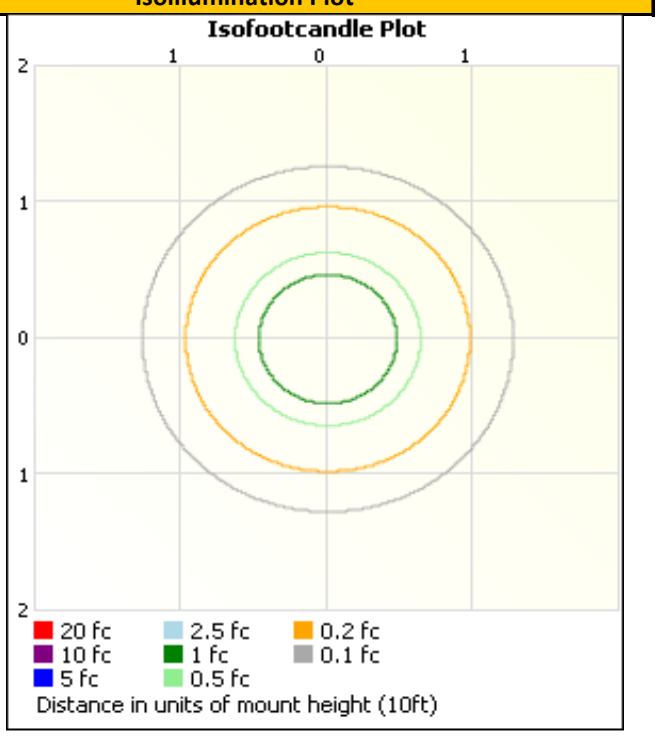
ILLUMINANCE SUMMARY

Mounting Height: 10ft

Illuminance - Cone Of Light



Isoillumination Plot



ZONAL LUMENS

Zonal Lumen Summary

Zone	Lumens	Luminaire
0-30	146.8	44.1%
0-40	193.6	58.2%
0-60	267.5	80.4%
60-90	44.4	13.3%
70-100	27.7	8.3%
90-120	13.5	4.1%
0-90	311.9	93.7%
90-180	20.9	6.3%
0-180	332.8	100.0%

Zone	Lumens	Total	Zone	Lumens	Total
0-10	23.2	7.0%	90-100	5.2	1.6%
10-20	60.6	18.2%	100-110	4.4	1.3%
20-30	63.0	18.9%	110-120	3.8	1.1%
30-40	46.7	14.0%	120-130	3.1	0.9%
40-50	41.0	12.3%	130-140	2.3	0.7%
50-60	32.9	9.9%	140-150	1.4	0.4%
60-70	22.0	6.6%	150-160	0.6	0.2%
70-80	14.1	4.2%	160-170	0.0	0.0%
80-90	8.3	2.5%	170-180	0.0	0.0%

Test Equipment Used:	1 thru 10				
Ambient Temp (ºC):	24.3	**Relative Hum (%):**	NA	**Test Completion Date**	10/18/2019

See last page for equipment details

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EQUIPMENT LIST

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	LSI High Speed Mirror Goniometer	6440	---	10/10/2019	11/10/2019
2	Elgar AC Power Supply	CW1251	---	VBU	VBU
3	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
4	Yokogawa Power Analyzer	WT210	E464	5/7/2019	5/7/2020
5	Omega Thermometer	DPi8-C24	M263	5/7/2019	5/7/2020
6	M-D Building Products Digital Level	Smart Tool	L112	5/1/2019	5/1/2020
7	NIST Luminous Intensity Standard Source	NBS10322	N1427	2/11/2019	2/11/2021
8	NIST Luminous Intensity Standard Source	NBS10332	N1435	2/11/2019	2/11/2021
9	NIST Luminous Intensity Standard Source	NBS10265	N1437	2/11/2019	2/11/2021
10	NIST Luminous Flux Standard Source	NBS10428	N1424	1/3/2019	1/3/2021