

SONNEMAN - A WAY OF LIGHT

TEST REPORT

SCOPE OF WORK

Electrical and Photometric tests as required to the IESNA test standard.

MODEL NUMBER

2870

PROJECT NUMBER

G103526294

REPORT NUMBER

103526294CRT-001

ISSUE DATE

May 24, 2018

REVISION DATE

None

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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TEST REPORT**REPORT NO.: 103526294CRT-001****REPORT DATE: May 24, 2018**

TEST OF (1) TORUS 24" LED PENDANT

MODEL NO. 2870

RENDERED TO:

SONNEMAN - A WAY OF LIGHT
151 AIRPORT DRIVE
WAPPINGERS FALLS, NY 12590**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-00886477.

STANDARDS USED

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

SAMPLE INFORMATION

| CONTROL NO. | MODEL/SERIAL NO. | DESCRIPTION | TYPE | RECEIVED |
|-------------------|------------------|-----------------------|------------|-----------|
| CRT1805221048-004 | 2870 | Torus 24" LED Pendant | Production | 5/22/2018 |

DATE OF TESTS

May 23, 2018.

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REPORT NO.: 103526294CRT-001

REPORT DATE: May 24, 2018

SUMMARY

| | |
|-------------------------|----------------------------|
| MODEL NO: | 2870 |
| DESCRIPTION: | Torus 24" LED Pendant |
| LED MODEL NO: | Luminus 2016, 3000K, 90CRI |
| DRIVER MODEL NO: | ERP ESS030W-0900-32 |

| CRITERIA | RESULTS |
|------------------------------------|---------|
| Lumen Output (lumens) | 1163.3 |
| Input Power (W) @ 120 (VAC) | 25.35 |
| Lumen Efficacy (lm/W) | 45.9 |
| Input Power Factor () @ 120 (VAC) | 0.978 |

EQUIPMENT LIST

| EQUIPMENT USED | MODEL NO. | CONTROL NO. | CAL DUE DATE | DATE USED |
|---|------------|-------------|--------------|-----------|
| LSI High Speed Mirror Goniometer | 6440 | --- | 6/10/2018 | 5/23/2018 |
| Elgar AC Power Supply | CW1251 | --- | VBU | 5/23/2018 |
| Sorenson DC Power Supply | XG 150-10 | --- | VBU | 5/23/2018 |
| Yokogawa Power Analyzer | WT210 | E464 | 5/3/2019 | 5/23/2018 |
| Omega Thermometer | DPi8-C24 | M263 | 5/3/2019 | 5/23/2018 |
| M-D Building Products Digital Level | Smart Tool | L112 | 4/21/2019 | 5/23/2018 |
| NIST Luminous Intensity Standard Source | NBS10322 | N1427 | 1/9/2019 | 5/23/2018 |
| NIST Luminous Intensity Standard Source | NBS10332 | N1435 | 1/9/2019 | 5/23/2018 |
| NIST Luminous Intensity Standard Source | NBS10265 | N1437 | 1/9/2019 | 5/23/2018 |
| NIST Luminous Flux Standard Source | NBS10428 | N1424 | 1/11/2019 | 5/23/2018 |

TEST REPORT**REPORT NO.: 103526294CRT-001****REPORT DATE: May 24, 2018****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 (candelas) 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.

TEST REPORT

REPORT NO.: 103526294CRT-001

REPORT DATE: May 24, 2018

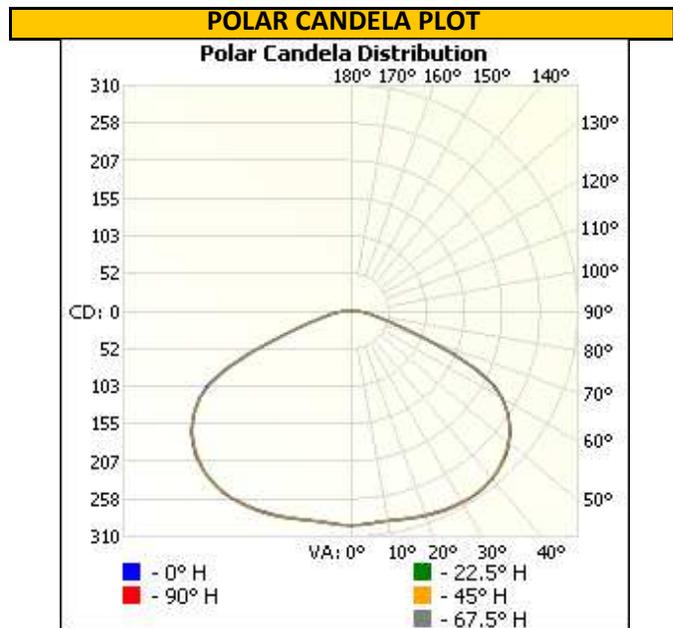
RESULTS OF TESTS

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

| INTERTEK CONTROL NO. | BASE POSITION | INPUT VOLTAGE (VAC) | INPUT CURRENT (mA) | INPUT POWER (W) | INPUT POWER FACTOR () | LIGHT OUTPUT (lm) | LUMEN EFFICACY (lm/W) |
|----------------------|---------------|---------------------|--------------------|-----------------|------------------------|-------------------|-----------------------|
| CRT1805221048-004 | Base Up | 120.05 | 215.9 | 25.35 | 0.978 | 1163.3 | 45.9 |

INTENSITY SUMMARY - CANDELAS

| Angle | 0 | 22.5 | 45 | 67.5 | 90 |
|-------|-----|------|-----|------|-----|
| 0 | 294 | 294 | 294 | 294 | 294 |
| 5 | 292 | 293 | 293 | 293 | 294 |
| 10 | 292 | 292 | 292 | 293 | 292 |
| 15 | 295 | 295 | 294 | 296 | 295 |
| 20 | 298 | 299 | 299 | 299 | 299 |
| 25 | 301 | 302 | 301 | 301 | 303 |
| 30 | 303 | 303 | 304 | 303 | 304 |
| 35 | 304 | 303 | 302 | 304 | 304 |
| 40 | 301 | 299 | 300 | 301 | 300 |
| 45 | 292 | 292 | 291 | 293 | 294 |
| 50 | 281 | 281 | 281 | 282 | 281 |
| 55 | 264 | 263 | 264 | 263 | 264 |
| 60 | 238 | 237 | 237 | 238 | 239 |
| 65 | 191 | 189 | 185 | 184 | 186 |
| 70 | 106 | 105 | 102 | 101 | 100 |
| 75 | 53 | 53 | 54 | 53 | 52 |
| 80 | 30 | 30 | 31 | 31 | 31 |
| 85 | 20 | 20 | 20 | 21 | 21 |
| 90 | 0 | 0 | 0 | 0 | 0 |
| 95 | 2 | 2 | 2 | 2 | 2 |
| 100 | 2 | 2 | 2 | 2 | 2 |



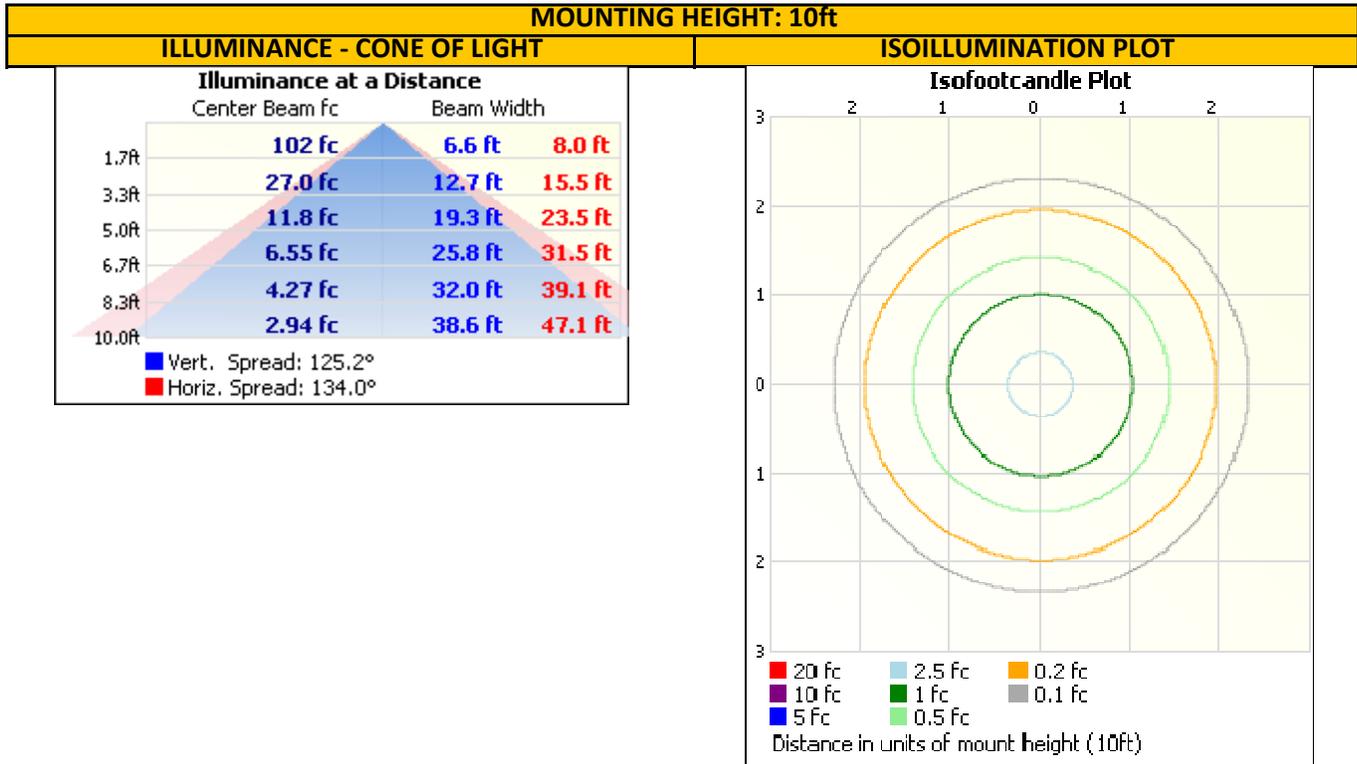
TEST REPORT

REPORT NO.: 103526294CRT-001

REPORT DATE: May 24, 2018

RESULTS OF TESTS

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



ZONAL LUMEN SUMMARY AND PERCENTAGES

| ZONE | LUMENS | % LUMINAIRE |
|--------|--------|-------------|
| 0-30 | 251.2 | 21.6 |
| 0-40 | 441.4 | 37.9 |
| 0-60 | 902.0 | 77.5 |
| 60-90 | 259.2 | 22.3 |
| 0-90 | 1161.2 | 99.8 |
| 90-180 | 2.2 | 0.2 |
| 0-180 | 1163.3 | 100.0 |

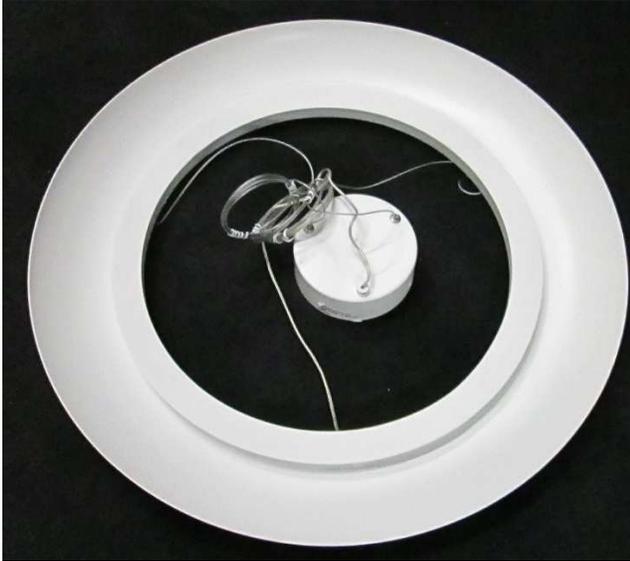
| ZONE | LUMENS | % LUMINAIRE |
|---------|--------|-------------|
| 0-10 | 27.9 | 2.4 |
| 10-20 | 83.8 | 7.2 |
| 20-30 | 139.5 | 12.0 |
| 30-40 | 190.2 | 16.3 |
| 40-50 | 225.8 | 19.4 |
| 50-60 | 234.7 | 20.2 |
| 60-70 | 178.0 | 15.3 |
| 70-80 | 61.1 | 5.2 |
| 80-90 | 20.1 | 1.7 |
| 90-100 | 1.7 | 0.1 |
| 100-110 | 0.5 | 0.0 |

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REPORT NO.: 103526294CRT-001

REPORT DATE: May 24, 2018

PICTURES



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

Kristie Ray

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Report Reviewed By:

Jacki Swiernik

Jacki Swiernik
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Attachments: IES File

REVISION HISTORY

| JOB NUMBER | DATE OF REVISION | PROJECT HANDLER | REVIEWED BY | REVISION NOTE |
|------------|------------------|-----------------|-------------|---------------|
| None | | | | |