



LAB 1
Sphere

Test Sample Description

Catalog Number: P300185-015-30
Description: 1-Lt. LED Bath w/ Etched Opal Refractor

Photometry

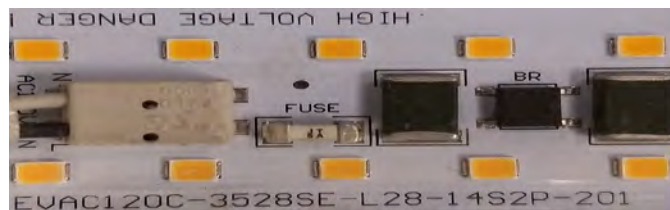
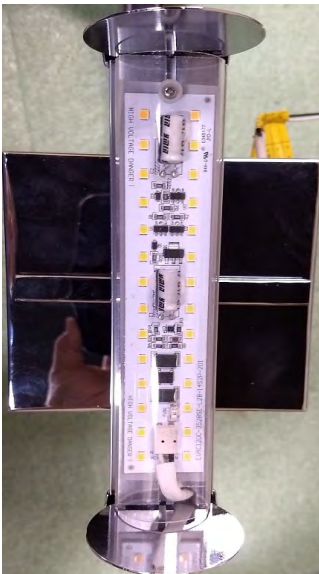
Test Method: IES LM-46-04
IES LM-79-08 §10
Preburn Time: 0:10
Time To Stabilize: 1:15
Total Operating Time: 1:27

Input Voltage (Volts): 119.8
Input Current (Amps): 0.082
Input Wattage (Watts): 9.7
Ambient Temp (°C): 26.1

Sphere

Test Method: IES LM-16-93
IES LM-79-08 §12.1
Preburn Time: 0:30
Time To Stabilize: 1:16
Total Operating Time: 1:46

Input Voltage (Volts): 120.0
Input Current (Amps): 0.082
Input Wattage (Watts): 9.7
Ambient Temp (°C): 24.0
PF @ 120V: 0.989
THD @ 120V (%): 11.8



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Checked (sphere): D. ROBBINS
Checked (photometry): D. ROBBINS
Approved: P. McCARTHY

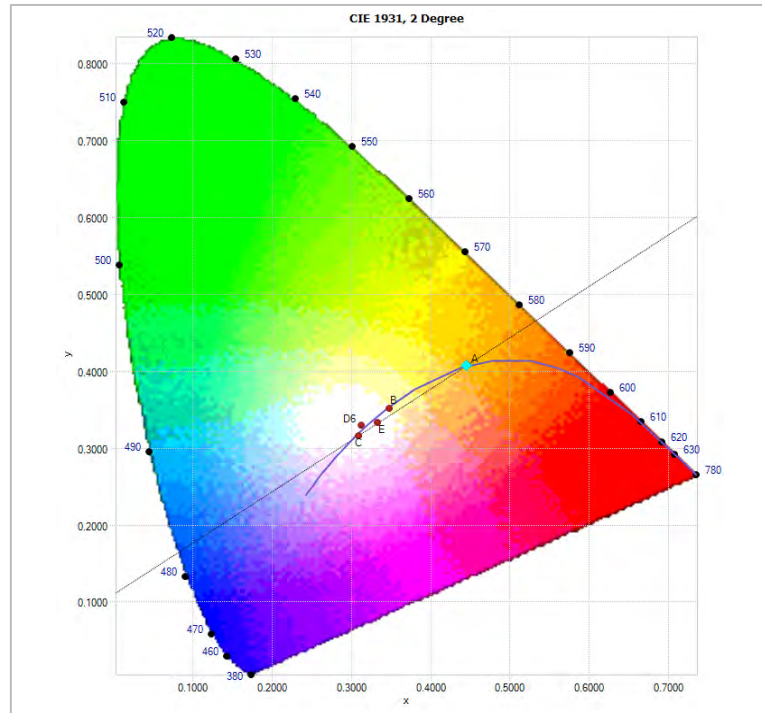




Lamp Cat#: EVAC120C-3528SE-L28-14S2P-201
 Lamp Desc: 28 - Seoul 3000K LEDs
 Driver Desc: NA

Efficacy: 56.2 LPW S/P Ratio: 1.3 LM/LM

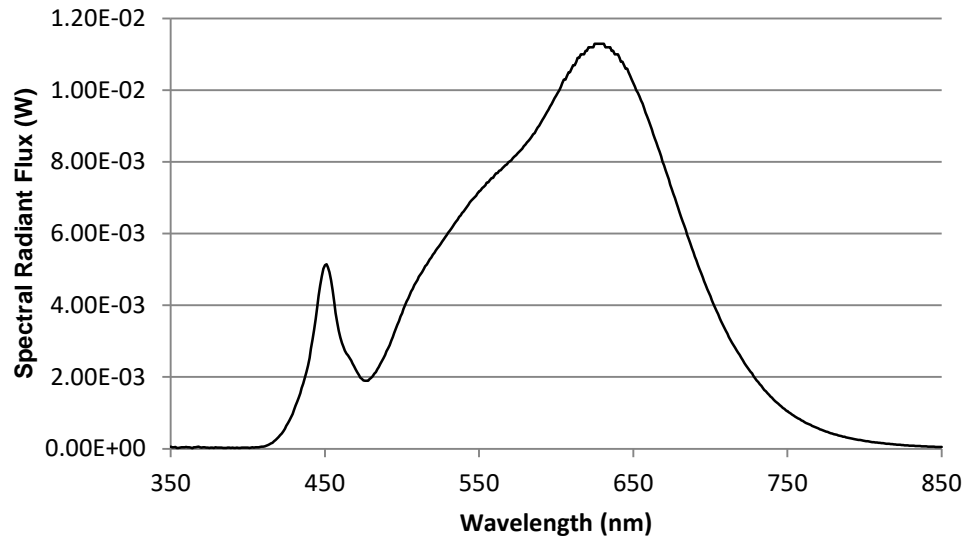
Chromaticity Diagram



Spectral Results

| Name | Value | Unit |
|--------------|-------------|--------|
| Φ | 1.97 | watts |
| Φ(v) | 545 | lumens |
| Φ(v') | 735 | lm' |
| Chrom x | 0.4449 | |
| Chrom y | 0.4077 | |
| Chrom u | 0.2542 | |
| Chrom v | 0.3493 | |
| Duv | 0 | |
| Chrom u' | 0.2542 | |
| Chrom v' | 0.524 | |
| CCT | 2897 | K |
| Purity | 55.9 | % |
| λ (dom) | 583.1 | nm |
| FWHM | 163.7 | nm |
| λ (peak) | 628.9 | nm |
| λ (center) | 605.7 | nm |
| λ (centroid) | 599.9 | nm |
| SDCM | Cool White | |
| RA | 93 | |
| Corr. Coef. | 0.000436022 | |
| Correlation | 0.0054 | |
| R1 | 93.9 | |
| R2 | 95.1 | |
| R3 | 94.4 | |
| R4 | 94.2 | |
| R5 | 93.0 | |
| R6 | 93.4 | |
| R7 | 94.7 | |
| R8 | 87.2 | |
| R9 | 69.4 | |
| R10 | 87.2 | |
| R11 | 94.5 | |
| R12 | 81.0 | |
| R13 | 94.0 | |
| R14 | 96.0 | |

Spectral Distribution of Radiant Flux





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REPORT NUMBER: 18.00097

PAGE: 1 OF 9

ISSUE DATE: 02/01/18

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CATALOG NUMBER: P300185-015-30

LUMINAIRE: 1- Lt. LED Bath w/ Etched Opal Refractor

LAMP CAT. NO.: EVAC120C-3528SE-L28-14S2P-201

LAMP: 28- Seoul 3000K LEDs

MOUNTING: Wall

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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REPORT NUMBER: 18.00097
ISSUE DATE: 02/01/18
PREPARED FOR: PROGRESS
CATALOG NUMBER: P300185-015-30

PAGE: 4 OF 9

CANDELA DISTRIBUTION

| | 0.0 | 45.0 | 90.0 | 135.0 | 180.0 |
|-----|------|------|------|-------|-------|
| 0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 5 | 6.6 | 6.4 | 5.8 | 4.2 | 3.5 |
| 15 | 20.9 | 19.0 | 15.1 | 9.2 | 5.9 |
| 25 | 32.4 | 31.3 | 23.9 | 12.9 | 6.2 |
| 35 | 44.5 | 42.5 | 32.0 | 15.6 | 5.2 |
| 45 | 53.8 | 52.3 | 39.2 | 18.2 | 4.2 |
| 55 | 63.3 | 61.8 | 46.1 | 20.7 | 3.5 |
| 65 | 71.1 | 69.5 | 51.7 | 22.7 | 3.0 |
| 75 | 77.2 | 75.5 | 56.4 | 24.9 | 3.0 |
| 85 | 78.9 | 77.3 | 57.2 | 24.5 | 2.7 |
| 90 | 80.1 | 78.2 | 58.0 | 25.0 | 2.9 |
| 95 | 79.0 | 77.3 | 57.3 | 24.2 | 1.9 |
| 105 | 76.5 | 74.7 | 55.6 | 23.9 | 1.5 |
| 115 | 71.9 | 70.0 | 52.5 | 22.9 | 2.2 |
| 125 | 71.3 | 62.7 | 47.1 | 21.2 | 3.2 |
| 135 | 57.2 | 54.1 | 39.8 | 18.0 | 3.2 |
| 145 | 45.3 | 43.8 | 32.1 | 15.2 | 3.6 |
| 155 | 33.9 | 32.8 | 24.5 | 12.7 | 4.2 |
| 165 | 22.3 | 19.9 | 15.3 | 9.2 | 3.7 |
| 175 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 180 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

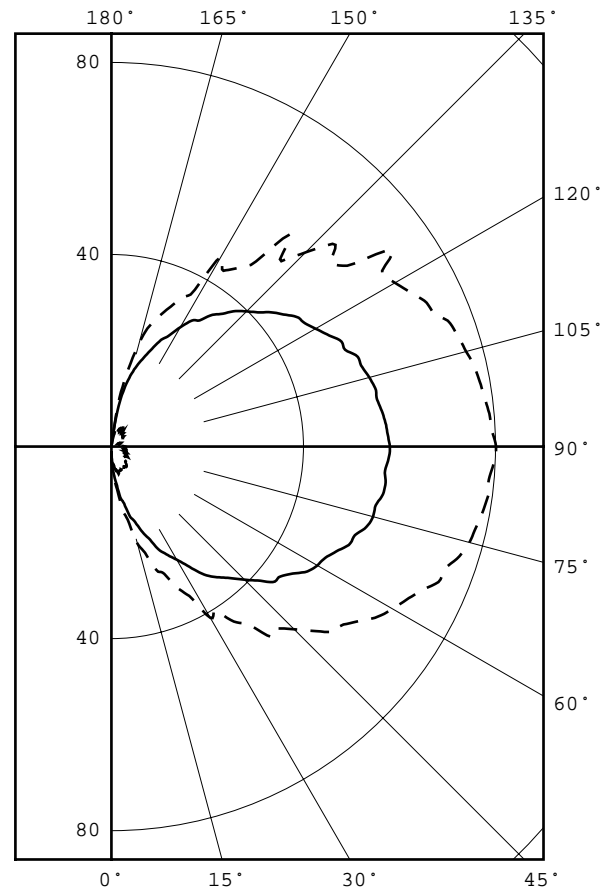
FLUX

| |
|----|
| 1 |
| 4 |
| 10 |
| 18 |
| 27 |
| 37 |
| 45 |
| 52 |
| 55 |
| 54 |
| 51 |
| 45 |
| 37 |
| 28 |
| 18 |
| 10 |
| 4 |
| 0 |

ZONAL LUMEN SUMMARY

| ZONE | LUMENS | %FIXT |
|--------|--------|-------|
| 0- 30 | 15 | 2.9 |
| 0- 40 | 33 | 6.6 |
| 0- 60 | 96 | 19.4 |
| 0- 90 | 248 | 50.0 |
| 90-120 | 150 | 30.3 |
| 90-130 | 187 | 37.8 |
| 90-150 | 233 | 47.1 |
| 90-180 | 248 | 50.0 |
| 0-180 | 496 | 100.0 |

EFFICACY = 50.9 lm/W
CIE TYPE - GENERAL DIFFUSE
PLANE : 0-DEG 90-DEG
SHIELDING ANGLES : 90 90



LEGEND
0-deg - - - - -
90-deg - - - - -
180-deg - - - - -



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PREPARED FOR: PROGRESS
CATALOG NUMBER: P300185-015-30

PAGE: 5 OF 9

PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 2.500 2.500
HEIGHT OF SIDE : 7.500 7.500

LUMINANCE DATA IN CANDELA/SQ M
ANGLE AVERAGE AVERAGE AVERAGE
IN DEG 0-DEG 90-DEG 180-DEG
45 4717. 3437. 368.
55 5179. 3772. 286.
65 5613. 4081. 237.
75 6065. 4431. 236.
85 6362. 4612. 218.



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REPORT NUMBER: 18.00097

PAGE: 6 OF 9

ISSUE DATE: 02/01/18

PREPARED FOR: PROGRESS

CATALOG NUMBER: P300185-015-30

CANDELA DISTRIBUTION
LATERAL ANGLE

| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 | 112.5 | 135.0 | 157.5 | 180.0 |
|-------|------|------|------|------|------|-------|-------|-------|-------|
| 0.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 5.0 | 6.6 | 6.2 | 6.4 | 6.2 | 5.8 | 4.9 | 4.2 | 3.7 | 3.5 |
| 10.0 | 13.4 | 13.1 | 12.8 | 12.0 | 10.7 | 9.0 | 7.0 | 5.7 | 5.1 |
| 15.0 | 20.9 | 20.4 | 19.0 | 17.6 | 15.1 | 12.2 | 9.2 | 6.8 | 5.9 |
| 20.0 | 27.4 | 26.1 | 24.5 | 22.0 | 19.0 | 14.9 | 10.4 | 6.7 | 5.3 |
| 25.0 | 32.4 | 33.7 | 31.3 | 28.1 | 23.9 | 18.8 | 12.9 | 7.7 | 6.2 |
| 30.0 | 41.2 | 38.8 | 35.5 | 32.1 | 27.2 | 21.0 | 13.5 | 6.5 | 5.1 |
| 35.0 | 44.5 | 45.9 | 42.5 | 37.5 | 32.0 | 24.9 | 15.6 | 6.9 | 5.2 |
| 40.0 | 51.7 | 50.6 | 47.1 | 41.9 | 35.6 | 27.5 | 17.0 | 6.2 | 4.8 |
| 45.0 | 53.8 | 56.3 | 52.3 | 46.5 | 39.2 | 30.4 | 18.2 | 5.8 | 4.2 |
| 50.0 | 60.1 | 62.8 | 58.1 | 51.7 | 43.9 | 34.1 | 20.6 | 6.2 | 4.8 |
| 55.0 | 63.3 | 67.2 | 61.8 | 54.6 | 46.1 | 35.3 | 20.7 | 4.9 | 3.5 |
| 60.0 | 67.6 | 71.9 | 66.4 | 58.6 | 49.5 | 38.0 | 22.0 | 4.9 | 3.6 |
| 65.0 | 71.1 | 75.6 | 69.5 | 61.2 | 51.7 | 39.6 | 22.7 | 4.3 | 3.0 |
| 70.0 | 74.0 | 79.3 | 72.5 | 64.0 | 54.0 | 41.3 | 23.6 | 4.2 | 2.8 |
| 75.0 | 77.2 | 82.6 | 75.5 | 66.7 | 56.4 | 43.3 | 24.9 | 4.6 | 3.0 |
| 80.0 | 78.5 | 84.3 | 77.1 | 68.0 | 57.4 | 43.9 | 24.9 | 4.3 | 3.0 |
| 85.0 | 78.9 | 84.7 | 77.3 | 68.0 | 57.2 | 43.8 | 24.5 | 3.4 | 2.7 |
| 90.0 | 80.1 | 85.9 | 78.2 | 69.0 | 58.0 | 44.5 | 25.0 | 3.9 | 2.9 |
| 95.0 | 79.0 | 84.8 | 77.3 | 68.0 | 57.3 | 43.6 | 24.2 | 3.2 | 1.9 |
| 100.0 | 77.9 | 83.4 | 76.0 | 66.9 | 56.2 | 42.7 | 23.8 | 2.9 | 1.2 |
| 105.0 | 76.5 | 81.8 | 74.7 | 66.0 | 55.6 | 42.4 | 23.9 | 3.4 | 1.5 |
| 110.0 | 75.1 | 80.0 | 73.0 | 64.7 | 54.6 | 41.9 | 24.1 | 4.3 | 2.2 |
| 115.0 | 71.9 | 76.4 | 70.0 | 62.0 | 52.5 | 40.2 | 22.9 | 4.3 | 2.2 |
| 120.0 | 68.2 | 72.0 | 65.9 | 58.5 | 49.1 | 37.4 | 21.5 | 3.9 | 2.2 |
| 125.0 | 71.3 | 68.3 | 62.7 | 55.5 | 47.1 | 36.1 | 21.2 | 5.1 | 3.2 |
| 130.0 | 59.8 | 64.5 | 58.4 | 51.5 | 43.5 | 33.3 | 19.7 | 5.1 | 3.3 |
| 135.0 | 57.2 | 57.2 | 54.1 | 47.1 | 39.8 | 30.4 | 18.0 | 5.2 | 3.2 |
| 140.0 | 57.5 | 51.8 | 48.1 | 42.9 | 36.1 | 27.7 | 16.8 | 5.7 | 3.4 |
| 145.0 | 45.3 | 50.2 | 43.8 | 37.9 | 32.1 | 24.6 | 15.2 | 5.9 | 3.6 |
| 150.0 | 45.7 | 41.6 | 38.2 | 34.4 | 28.7 | 22.3 | 14.5 | 7.1 | 4.4 |
| 155.0 | 33.9 | 36.8 | 32.8 | 28.8 | 24.5 | 19.0 | 12.7 | 6.7 | 4.2 |
| 160.0 | 28.8 | 28.1 | 25.4 | 23.0 | 19.7 | 15.3 | 10.6 | 6.2 | 3.0 |
| 165.0 | 22.3 | 21.4 | 19.9 | 18.0 | 15.3 | 12.2 | 9.2 | 5.7 | 3.7 |
| 170.0 | 11.6 | 11.8 | 11.5 | 10.2 | 8.6 | 6.2 | 4.1 | 2.2 | 1.5 |
| 175.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 180.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |



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CATALOG NUMBER: P300185-015-30

PAGE: 7 OF 9

| 5-DEGREE ZONAL LUMEN SUMMARY | | |
|---------------------------------|--|----|
| 0- 5 | | 0 |
| 5- 10 | | 1 |
| 10- 15 | | 1 |
| 15- 20 | | 3 |
| 20- 25 | | 4 |
| 25- 30 | | 6 |
| 30- 35 | | 8 |
| 35- 40 | | 10 |
| 40- 45 | | 12 |
| 45- 50 | | 15 |
| 50- 55 | | 17 |
| 55- 60 | | 20 |
| 60- 65 | | 21 |
| 65- 70 | | 24 |
| 70- 75 | | 25 |
| 75- 80 | | 26 |
| 80- 85 | | 27 |
| 85- 90 | | 28 |
| 90- 95 | | 27 |
| 95-100 | | 27 |
| 100-105 | | 26 |
| 105-110 | | 25 |
| 110-115 | | 23 |
| 115-120 | | 22 |
| 120-125 | | 20 |
| 125-130 | | 17 |
| 130-135 | | 15 |
| 135-140 | | 13 |
| 140-145 | | 10 |
| 145-150 | | 8 |
| 150-155 | | 6 |
| 155-160 | | 4 |
| 160-165 | | 3 |
| 165-170 | | 1 |
| 170-175 | | 0 |
| 175-180 | | 0 |

| 10-DEGREE ZONAL LUMEN SUMMARY | | |
|----------------------------------|--|-----|
| 0- 10 | | 1 |
| 0- 20 | | 5 |
| 0- 30 | | 15 |
| 0- 40 | | 33 |
| 0- 50 | | 60 |
| 0- 60 | | 96 |
| 0- 70 | | 141 |
| 0- 80 | | 193 |
| 0- 90 | | 248 |
| 0-100 | | 302 |
| 0-110 | | 354 |
| 0-120 | | 398 |
| 0-130 | | 435 |
| 0-140 | | 463 |
| 0-150 | | 481 |
| 0-160 | | 492 |
| 0-170 | | 496 |
| 0-180 | | 496 |



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CATALOG NUMBER: P300185-015-30

PAGE: 8 OF 9

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

| RC | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 | |
|----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | | 10 |
| 0 | 107 | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 | 50 |
| 1 | 92 | 85 | 79 | 74 | 74 | 84 | 78 | 73 | 68 | 65 | 60 | 57 | 52 | 49 | 46 | 41 | 38 | 36 | 30 |
| 2 | 82 | 71 | 63 | 56 | 56 | 74 | 65 | 58 | 51 | 53 | 48 | 43 | 43 | 38 | 34 | 33 | 29 | 26 | 21 |
| 3 | 73 | 61 | 51 | 44 | 44 | 66 | 56 | 47 | 40 | 45 | 39 | 33 | 36 | 31 | 26 | 27 | 23 | 20 | 15 |
| 4 | 66 | 53 | 43 | 36 | 36 | 60 | 48 | 39 | 33 | 39 | 32 | 27 | 31 | 26 | 21 | 23 | 19 | 16 | 12 |
| 5 | 60 | 46 | 37 | 29 | 29 | 54 | 42 | 33 | 27 | 34 | 27 | 22 | 27 | 22 | 17 | 20 | 16 | 13 | 9 |
| 6 | 55 | 41 | 31 | 25 | 25 | 50 | 37 | 29 | 23 | 30 | 24 | 19 | 24 | 19 | 14 | 18 | 14 | 11 | 7 |
| 7 | 51 | 37 | 27 | 21 | 21 | 46 | 33 | 25 | 19 | 27 | 21 | 16 | 22 | 16 | 12 | 16 | 12 | 9 | 6 |
| 8 | 47 | 33 | 24 | 18 | 18 | 42 | 30 | 22 | 17 | 25 | 18 | 14 | 19 | 14 | 11 | 15 | 11 | 8 | 5 |
| 9 | 43 | 30 | 21 | 16 | 16 | 39 | 27 | 20 | 14 | 22 | 16 | 12 | 18 | 13 | 9 | 13 | 9 | 7 | 4 |
| 10 | 40 | 27 | 19 | 14 | 14 | 37 | 25 | 18 | 13 | 20 | 14 | 10 | 16 | 11 | 8 | 12 | 9 | 6 | 4 |

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.



Goniophotometer Calibration

Calibration Lamp: GE 1000W, 120V, T6, CL (FEL)
Lamp Number: ITL78966-1000-38
Calibration Current: 8.300 Amps DC
Total Luminous Flux: 25889.0 Lumens
Calibration Date: 07/10/2017

| <i>Test Equipment Used</i> | | | |
|----------------------------|---------------------------------------|------------|-------------------------|
| <i>Instrument</i> | <i>Manufacturer / Model</i> | <i>S/N</i> | <i>Calibration Due:</i> |
| <i>Goniophotometer</i> | ITL/HLI LAB 1 - Test Distance: 31.74' | N/A | N/A |
| <i>Power Analyzer</i> | Yokogawa / WT 332 | C2QA27071V | 10/25/2018 |
| <i>Power Source</i> | Voltage-Regulated House Power | N/A | N/A |
| <i>Thermometer</i> | National Instruments / USB-TC01 | 176F4E3 | 10/26/2018 |

Sphere Calibration

Calibration Lamp: EIKO 28V75W/E10
Lamp Number: SCL-1400-J136
Calibration Current: 2.679 Amps
Total Luminous Flux: 1427 Lumens

| <i>Test Equipment Used - Color & SPD; THD & Power Factor</i> | | | |
|--|---------------------------------|--------------|-------------------------|
| <i>Instrument</i> | <i>Manufacturer / Model</i> | <i>S/N</i> | <i>Calibration Due:</i> |
| <i>3-Meter Sphere</i> | Labsphere / LMS-3M | N/A | Checked Daily |
| <i>Thermometer</i> | National Instruments / USB TC01 | 1912751 | 10/26/2018 |
| <i>LAMP Power Meter</i> | Yokogawa / WT332 | C2QA27075V | 10/25/2018 |
| <i>Power Supply</i> | Chroma / 61602 | 616020002113 | N/A |
| <i>Power Supply PF/THD</i> | Voltage-Regulated House Power | N/A | N/A |
| <i>Aux Lamp Supply</i> | Labsphere / LPS-100-0833 | 0331159372 | N/A |
| <i>Cal Lamp Supply</i> | Labsphere / LPS-150-0268 | 1218148505 | N/A |
| <i>Spectrometer</i> | Labsphere / CDS 1100 | 0624117792 | N/A |

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