

# VISUAL COMFORT AND COMPANY TEST REPORT

## SCOPE OF WORK

LED Performance Testing

## MODEL NUMBER

ESSF1206P4873930KWF1EF

## PROJECT NUMBER

G104941221

## REPORT NUMBER

104941221CHI-046

## ISSUE DATE

6/29/2022

## REVISED DATE

None

## TEST DATES

2022-06-27 through 2022-06-29.

## DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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## PAGES

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**REPORT NUMBER**  
104941221CHI-046

**MODEL NUMBER(s)**  
ESSF1212P4863930KWF1EF

**REPORT RENDERED TO:**  
VISUAL COMFORT AND COMPANY  
7400 LINDER AVE  
SKOKIE, IL 60077  
USA

**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-01236637-1.

**TEST STANDARDS**

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

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

IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

In Charge of Testing:



Nick Lau  
Engineer  
Lighting Division

Reviewer:



Jeff Davis  
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## SAMPLE INFORMATION

REPORT NO. 104941221CHI-046

### ITEMS RECEIVED

| Item No. | Control No.      | Model No.                  | Description                                        | Type       | Received  |
|----------|------------------|----------------------------|----------------------------------------------------|------------|-----------|
| 1        | AH06132022110621 | ESSF1206P4873930KWF1<br>EF | P SERIES, 1206<br>CHANNEL, 800LM/FT<br>930 LOUVERS | Production | 6/13/2022 |

### TESTED SAMPLE CONFIGURATIONS

| Config No. | Tested Model No.       | Item Nos. Utilized |
|------------|------------------------|--------------------|
| 1          | ESSF1206P4873930KWF1EF | 1                  |

### SAMPLE PHOTOS - TESTED CONFIGURATIONS



## SUMMARY

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### PRODUCT INFORMATION AND SUMMARY OF DATA

|                      |                                              |
|----------------------|----------------------------------------------|
| Product Model No.:   | ESSF1206P4873930KWF1EF                       |
| Product Description: | P SERIES, 1206 CHANNEL, 800LM/FT 930 LOUVERS |
| LED Model No.:       | AA5592-02                                    |
| Driver Model No.:    | NA                                           |
| Light Source:        | LED                                          |

| Criteria                          | Results         |                    |
|-----------------------------------|-----------------|--------------------|
|                                   | Goniophotometer | Integrating Sphere |
| Light Output (lumens)             | 1188.9          | 1203.8             |
| Input Power (W) @ 24 (Vdc)        | 28.62           | 28.40              |
| Lumen Efficacy (lm/W)             | 41.5            | 42.4               |
| Input Power Factor ( ) @ 24 (Vdc) | NA              | NA                 |

| Criteria                         | Results |
|----------------------------------|---------|
| Input ATHD (%) @ 24 (Vdc)        | NA      |
| Correlated Color Temperature (K) | 2990    |
| Color Rendering Index - Ra ( )   | 98.5    |
| Color Rendering Index - R9 ( )   | 95.8    |
| Duv ( )                          | 0.0003  |
| Chromaticity Coordinate (x)      | 0.438   |
| Chromaticity Coordinate (y)      | 0.405   |
| Chromaticity Coordinate (u')     | 0.251   |
| Chromaticity Coordinate (v')     | 0.522   |

## 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                  | ESSF1206P4873930KWF1EF | NA           |

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

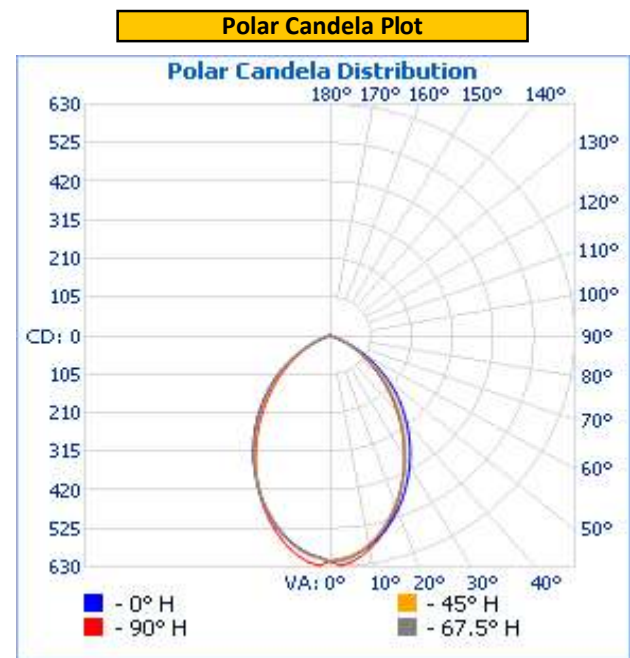
| Base Orientation | Input Voltage (Vdc) | Input Current (mA) | Input Power (W) | Input Power Factor ( ) |
|------------------|---------------------|--------------------|-----------------|------------------------|
| Up               | 24.01               | 1191.8             | 28.62           | NA                     |

| Light Output (lm) | Lumen Efficacy (lm/W) |
|-------------------|-----------------------|
| 1188.9            | 41.5                  |

## INTENSITY SUMMARY - CANDELA

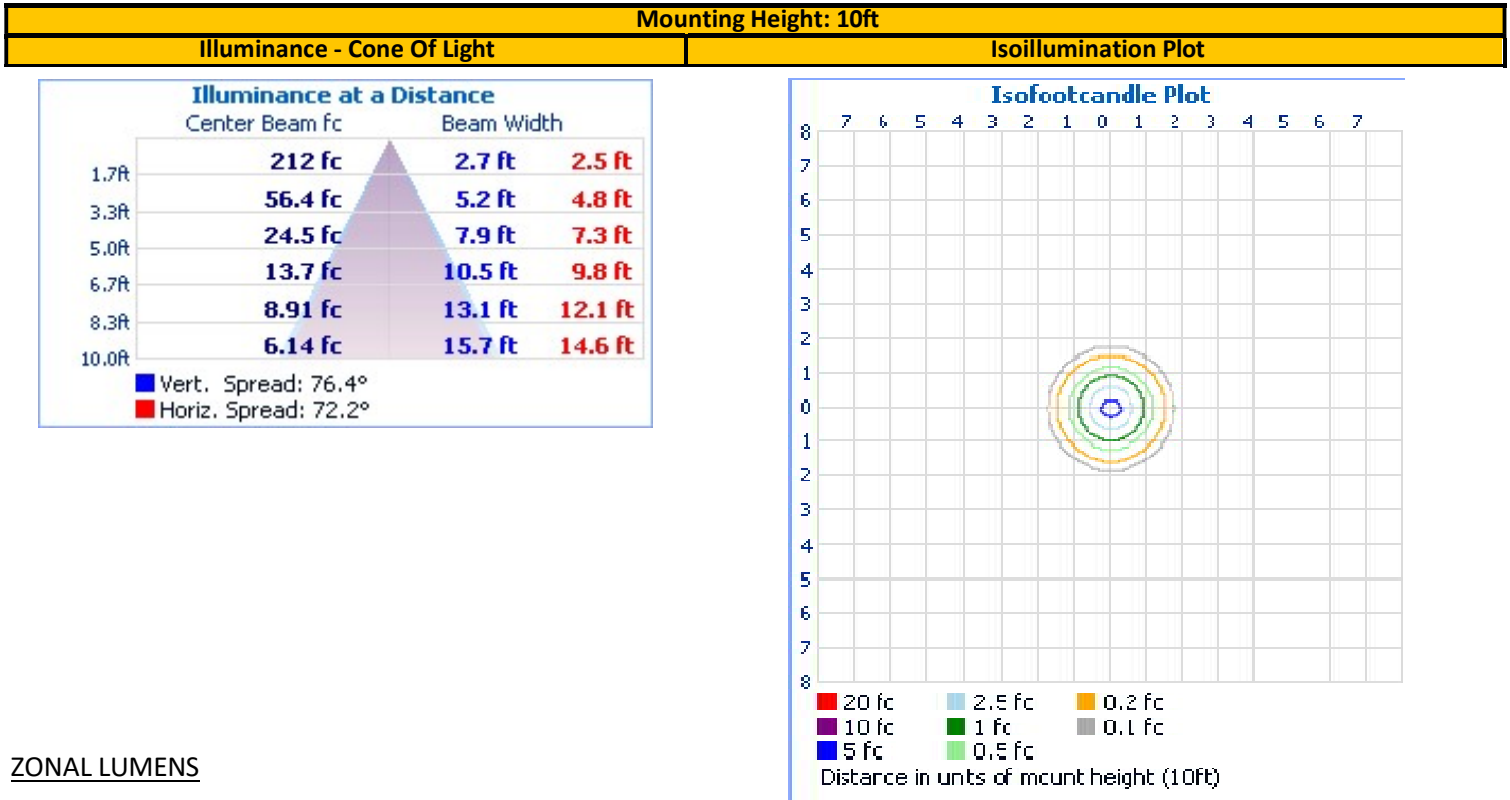
| Angle | 0     | 22.5  | 45    | 67.5  | 90    |
|-------|-------|-------|-------|-------|-------|
| 0     | 613.7 | 613.7 | 613.7 | 613.7 | 613.7 |
| 5     | 603.5 | 599.2 | 602.1 | 608.1 | 619.1 |
| 10    | 581.4 | 574.6 | 575.3 | 579.8 | 590.2 |
| 15    | 548.2 | 538.4 | 537.5 | 539.7 | 547.7 |
| 20    | 506.6 | 494.4 | 492.2 | 491.5 | 496.4 |
| 25    | 459.8 | 445.6 | 442.1 | 438.7 | 441.3 |
| 30    | 409.9 | 393.6 | 388.5 | 382.9 | 383.9 |
| 35    | 357.9 | 340.6 | 334.0 | 327.1 | 325.8 |
| 40    | 305.5 | 287.5 | 279.8 | 271.9 | 269.6 |
| 45    | 254.5 | 235.7 | 227.0 | 219.0 | 215.6 |
| 50    | 202.9 | 186.2 | 176.9 | 168.8 | 165.1 |
| 55    | 151.9 | 138.3 | 129.5 | 121.6 | 118.5 |
| 60    | 103.9 | 93.3  | 85.6  | 79.6  | 78.6  |
| 65    | 57.3  | 53.1  | 46.5  | 42.8  | 44.3  |
| 70    | 21.5  | 18.5  | 16.4  | 15.6  | 16.1  |
| 75    | 3.4   | 2.7   | 3.0   | 3.2   | 2.7   |
| 80    | 1.4   | 1.3   | 1.4   | 1.4   | 1.3   |
| 85    | 0.5   | 0.5   | 0.5   | 0.5   | 0.5   |
| 90    | 0     | 0     | 0     | 0     | 0     |
| 95    | 0     | 0     | 0     | 0     | 0     |
| 100   | 0     | 0     | 0     | 0     | 0     |
| 105   | 0     | 0     | 0     | 0     | 0     |
| 110   | 0     | 0     | 0     | 0     | 0     |
| 115   | 0     | 0     | 0     | 0     | 0     |
| 120   | 0     | 0     | 0     | 0     | 0     |
| 125   | 0     | 0     | 0     | 0     | 0     |
| 130   | 0     | 0     | 0     | 0     | 0     |
| 135   | 0     | 0     | 0     | 0     | 0     |
| 140   | 0     | 0     | 0     | 0     | 0     |
| 145   | 0     | 0     | 0     | 0     | 0     |
| 150   | 0     | 0     | 0     | 0     | 0     |
| 155   | 0     | 0     | 0     | 0     | 0     |
| 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     |

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                | 506.5  | 42.6%     | 90-100  | 0.0    | 0.0%  |
| 0-40                | 763.3  | 64.2%     | 100-110 | 0.0    | 0.0%  |
| 0-60                | 1122.3 | 94.4%     | 110-120 | 0.0    | 0.0%  |
| 60-90               | 66.6   | 5.6%      | 120-130 | 0.0    | 0.0%  |
| 70-100              | 7.1    | 0.6%      | 130-140 | 0.0    | 0.0%  |
| 90-120              | 0.0    | 0.0%      | 140-150 | 0.0    | 0.0%  |
| 0-90                | 1188.9 | 100.0%    | 150-160 | 0.0    | 0.0%  |
| 90-180              | 0.0    | 0.0%      | 160-170 | 0.0    | 0.0%  |
| 0-180               | 1188.9 | 100.0%    | 170-180 | 0.0    | 0.0%  |

## INTEGRATING SPHERE TESTING

REPORT NO. 104941221CHI-046

| Test Configuration | Tested Model No.       | Pass/Fail/NA |
|--------------------|------------------------|--------------|
| 1                  | ESSF1206P4873930KWF1EF | NA           |

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

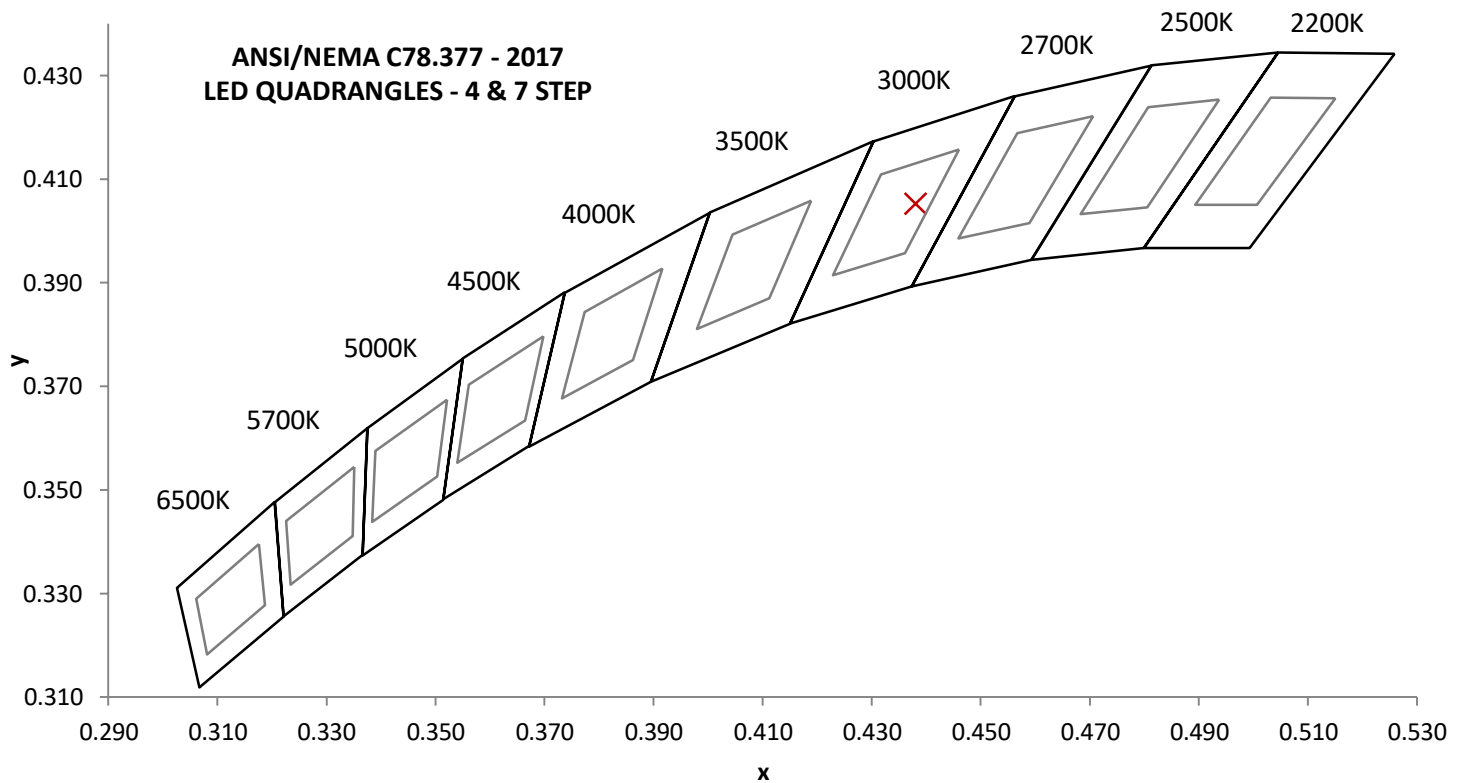
| Base Orientation |
|------------------|
| Up               |

| Input Voltage (Vdc) | Input Current (mA) | Input Power (W) | Input Power Factor (l) | Input ATHD (%) |
|---------------------|--------------------|-----------------|------------------------|----------------|
| 23.98               | 1184.1             | 28.40           | NA                     | NA             |

Measured at 23.98(Vdc)

| Light Output (lm) | Lumen Efficacy (lm/W) | CCT (K) | CRI - Ra (l) | CRI - R9 (l) |
|-------------------|-----------------------|---------|--------------|--------------|
| 1203.8            | 42.4                  | 2990    | 98.5         | 95.8         |

| Duv (l) | 1931 Chrom (x) | 1931 Chrom (y) | 1976 Chrom (u') | 1976 Chrom (v') |
|---------|----------------|----------------|-----------------|-----------------|
| 0.0003  | 0.438          | 0.405          | 0.251           | 0.522           |

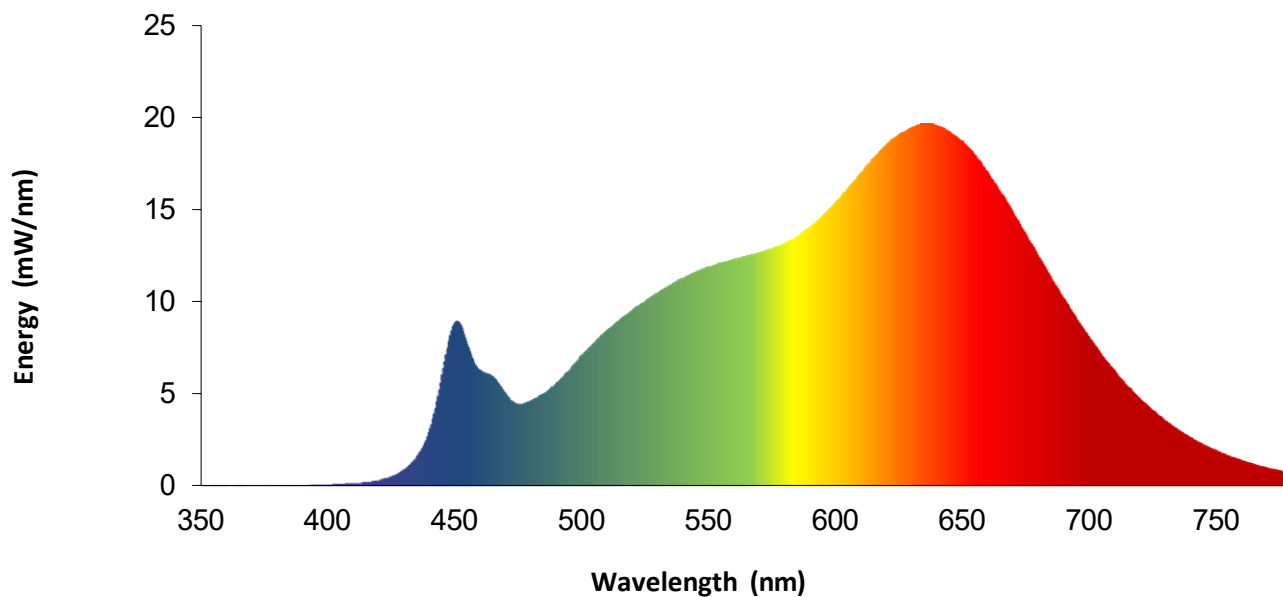


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

| nm  | mW/nm |  | nm  | mW/nm |  | nm  | mW/nm |  | nm  | mW/nm |
|-----|-------|--|-----|-------|--|-----|-------|--|-----|-------|
| 350 | 0.1   |  | 460 | 6.3   |  | 570 | 12.7  |  | 680 | 12.4  |
| 355 | 0.1   |  | 465 | 5.9   |  | 575 | 12.9  |  | 685 | 11.3  |
| 360 | 0.1   |  | 470 | 5.1   |  | 580 | 13.2  |  | 690 | 10.2  |
| 365 | 0.1   |  | 475 | 4.5   |  | 585 | 13.6  |  | 695 | 9.0   |
| 370 | 0.1   |  | 480 | 4.7   |  | 590 | 14.1  |  | 700 | 8.0   |
| 375 | 0.1   |  | 485 | 5.1   |  | 595 | 14.8  |  | 705 | 7.1   |
| 380 | 0.1   |  | 490 | 5.7   |  | 600 | 15.5  |  | 710 | 6.2   |
| 385 | 0.1   |  | 495 | 6.4   |  | 605 | 16.3  |  | 715 | 5.4   |
| 390 | 0.1   |  | 500 | 7.2   |  | 610 | 17.1  |  | 720 | 4.7   |
| 395 | 0.1   |  | 505 | 7.9   |  | 615 | 17.9  |  | 725 | 4.1   |
| 400 | 0.1   |  | 510 | 8.5   |  | 620 | 18.6  |  | 730 | 3.5   |
| 405 | 0.2   |  | 515 | 9.1   |  | 625 | 19.2  |  | 735 | 3.1   |
| 410 | 0.2   |  | 520 | 9.6   |  | 630 | 19.5  |  | 740 | 2.6   |
| 415 | 0.2   |  | 525 | 10.1  |  | 635 | 19.7  |  | 745 | 2.3   |
| 420 | 0.4   |  | 530 | 10.5  |  | 640 | 19.6  |  | 750 | 1.9   |
| 425 | 0.6   |  | 535 | 11.0  |  | 645 | 19.2  |  | 755 | 1.6   |
| 430 | 1.0   |  | 540 | 11.3  |  | 650 | 18.7  |  | 760 | 1.4   |
| 435 | 1.7   |  | 545 | 11.7  |  | 655 | 17.9  |  | 765 | 1.2   |
| 440 | 3.2   |  | 550 | 11.9  |  | 660 | 17.0  |  | 770 | 1.0   |
| 445 | 6.3   |  | 555 | 12.2  |  | 665 | 15.9  |  | 775 | 0.9   |
| 450 | 9.0   |  | 560 | 12.4  |  | 670 | 14.8  |  | 780 | 0.8   |
| 455 | 7.7   |  | 565 | 12.5  |  | 675 | 13.6  |  | --- | ---   |

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**

**REPORT NO. 104941221CHI-046**

| #  | Equipment                        | Model No | Control No. | Last Cal  | Cal Due   |
|----|----------------------------------|----------|-------------|-----------|-----------|
| 1  | Yokogawa Power Meter             | WT310E   | CHI0664     | 3/30/2022 | 3/30/2023 |
| 2  | Omega Thermometer                | DPI8-C24 | 146920      | 10/4/2021 | 10/4/2022 |
| 3  | LSI High Speed Mirror Goniometer | 6440T    | 146928      | VBV       | VBV       |
| 4  | Newport Thermohygrometer         | iServer  | CHI0452     | 2/3/2022  | 2/3/2023  |
| 5  | Chroma Power Supply              | 61604    | CHI0371     | VBV       | VBV       |
| 8  | Newport Humidity Recorder        | iServer  | 146961      | 9/21/2021 | 9/21/2022 |
| 9  | Labsphere Spectroradiometer      | CDS2600  | CHI0539     | VBV       | VBV       |
| 10 | 3 Meter Sphere                   | SPR600   | CHI0088     | VBV       | VBV       |
| 12 | Sorenson DC Power Supply         | XFR150-8 | 146846      | VBV       | VBV       |
| 13 | Yokogawa Power Meter             | WT1600   | 146769      | 4/5/1955  | 4/5/2023  |
| 17 | Omega thermometer                | USB TC08 | EQAHO02615  | 4/5/2022  | 4/5/2023  |

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

**REVISION HISTORY**

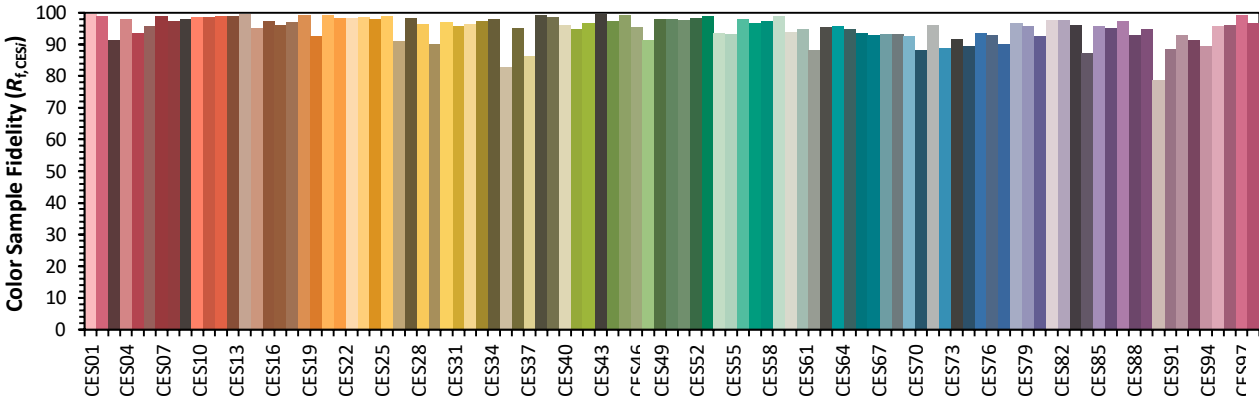
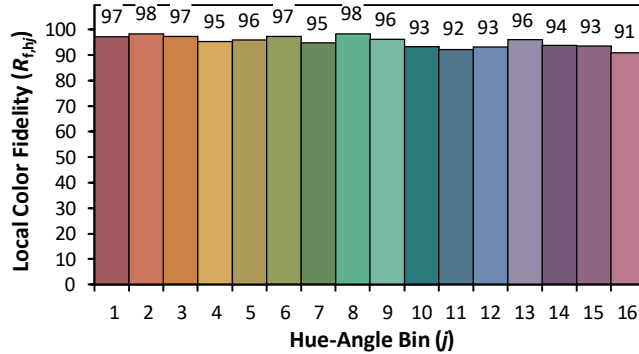
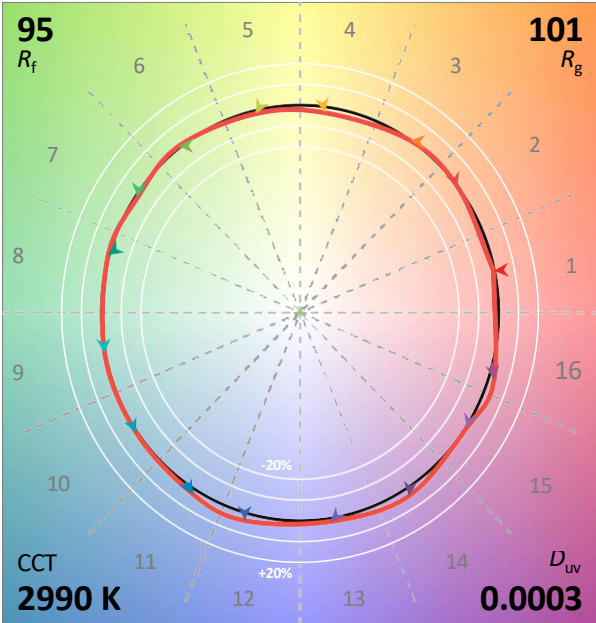
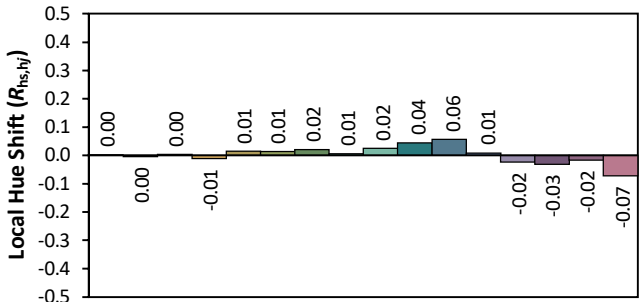
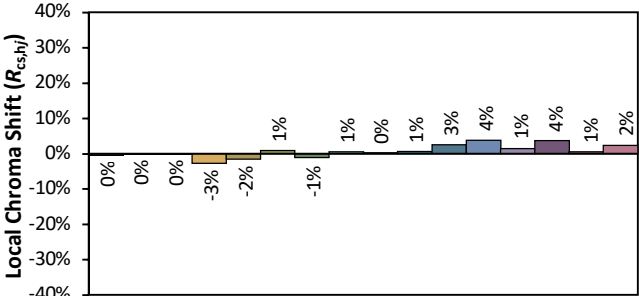
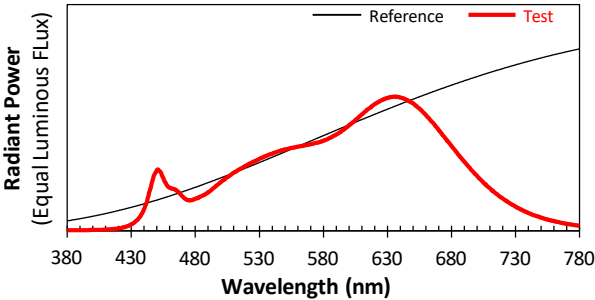
| #   | Revision Date | Updated By | Reviewed By | Description of Change |
|-----|---------------|------------|-------------|-----------------------|
| --- | None          | ---        | ---         | ---                   |
| --- | ---           | ---        | ---         | ---                   |
| --- | ---           | ---        | ---         | ---                   |

| Test Configuration | Tested Model No.       | Pass/Fail/NA |
|--------------------|------------------------|--------------|
| 1                  | ESSF1206P4873930KWF1EF | NA           |

ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD  
Date: 6/29/2022

Manufacturer: VISUAL COMFORT AND COMPANY  
Model: ESSF1206P4873930KWF1EF



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4380  
y 0.4052  
u' 0.2508