

# Photometric Report

EXTERIOR LINEAR PRO-GRAZE CTC 1FT – Cool White

*LM-79-08 Compliant*

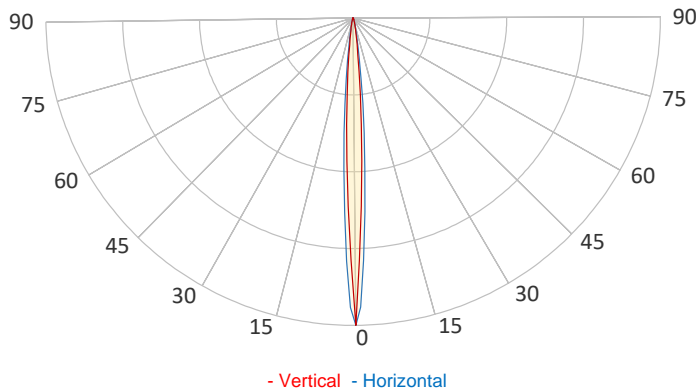
## GENERAL SPECIFICATIONS

|                       |         |
|-----------------------|---------|
| Total Fixture Output: | 849 lm  |
| Light Engine Output:  | 1200 lm |
| Efficacy:             | 71 lm/W |
| Lens Option:          | Graze   |
| Beam Angle H (50%):   | 9°      |
| Beam Angle V (50%):   | 9°      |
| CRI:                  | 70+     |
| CQS:                  | 73      |
| TM-30 Rf:             | 77      |
| TM-30 Rg:             | 94      |
| TLCI:                 | 55      |
| Color Temperature:    | 6500 k  |



## SAMPLE MEASUREMENT

POLAR PLOT

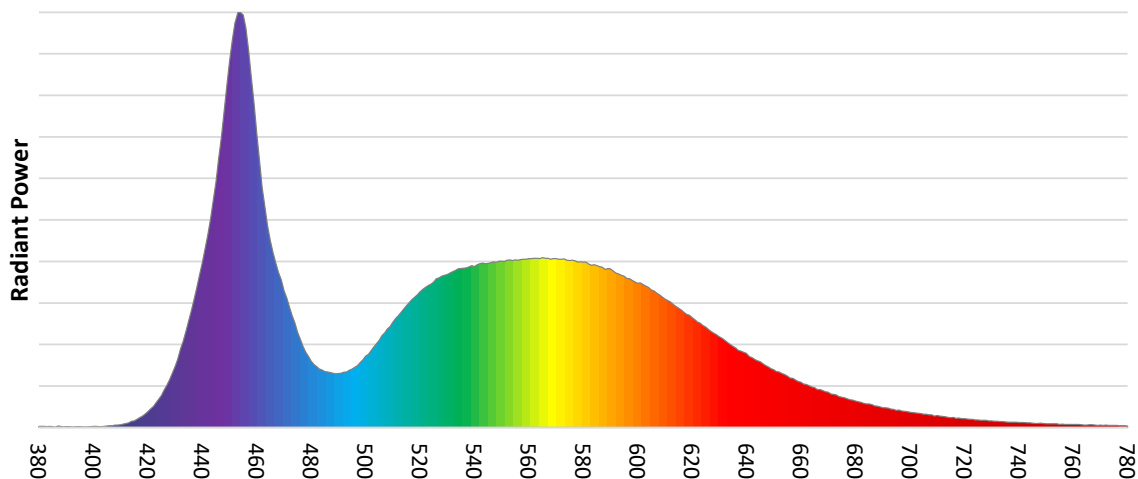


|                  |              |
|------------------|--------------|
| Catalog Number:  | MAR-90570006 |
| Measured Output: | 849 lm       |
| Measured Peak:   | 28610 cd     |
| Consumed Power:  | 12.5 W       |
| Efficacy:        | 67.9 lm/W    |

|                     |    |
|---------------------|----|
| Beam Angle H (50%): | 8° |
| Beam Angle V (50%): | 5° |

|                        |              |
|------------------------|--------------|
| Measurement Condition: |              |
| Ambient Temperature:   | 25° +/- 5° C |
| AC Supply:             | 230V/50Hz    |
| Fan Mode:              | No Fan       |
| Fixture Warm-up Time:  | 30 minutes   |

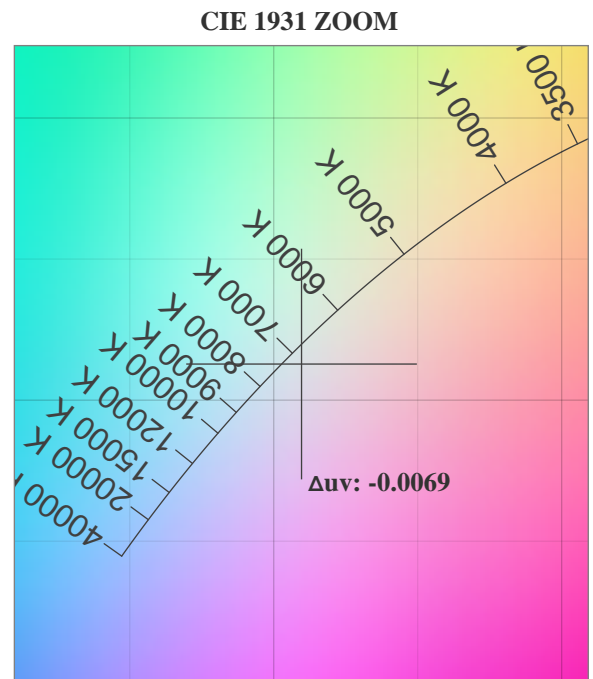
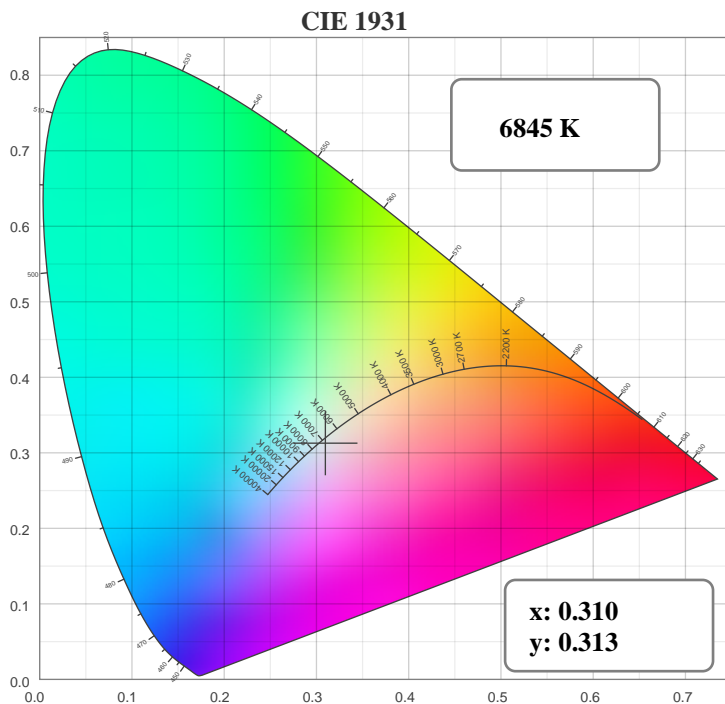
SPECTRAL DISTRIBUTION



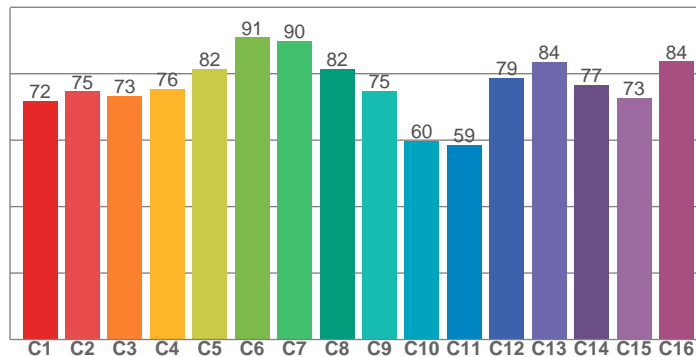
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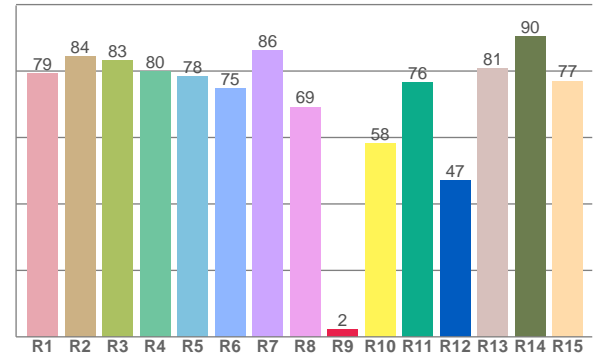
## CHROMATICITY



TM30: 76.8



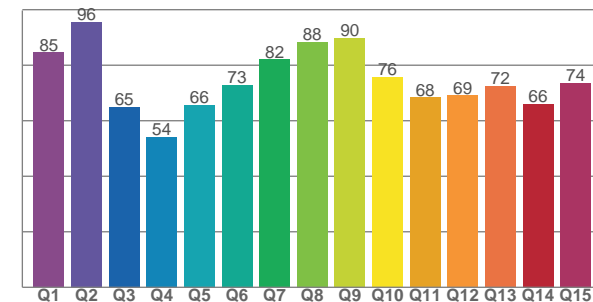
CRI: 79.4 (R1-R8)



## COLOR PARAMETERS

| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut |
|-------------------|-----------------------|---------------|----------------|-------------|
| CCT               | CRI                   | CRI R9        | TM30 Rf        | TM30 Rg     |
| 6845 K            | 79.4                  | 2.3           | 76.8           | 94.4        |

CQS: 72.6



| Television Lighting Consistency Index | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate CIE 1964 | Color Coordinate CIE 1964 | Color Deviation from Black Body |
|---------------------------------------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------------|
| TLCI                                  | CQS                 | x                         | y                         | u                         | v                         | $\Delta uv$                     |
| 55                                    | 72.6                | 0.310                     | 0.313                     | 0.202                     | 0.306                     | -0.0069                         |

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TM30

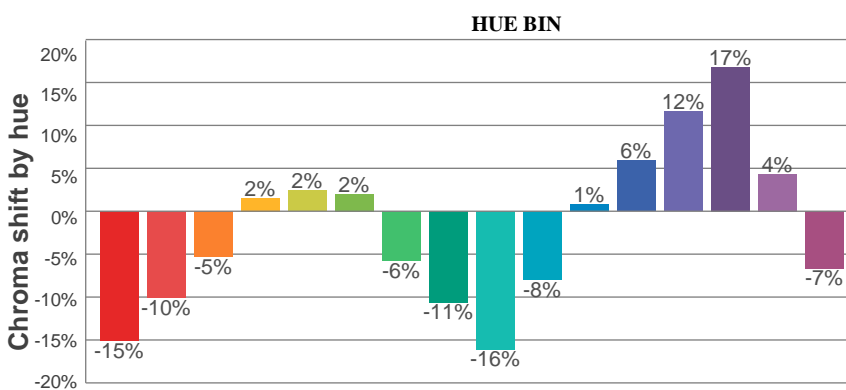
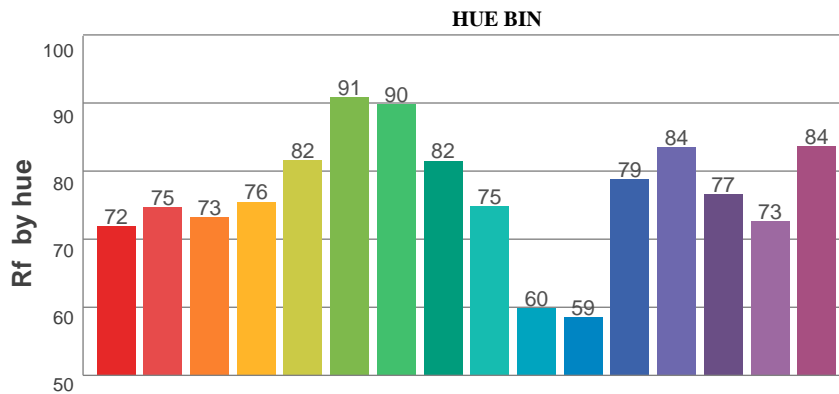
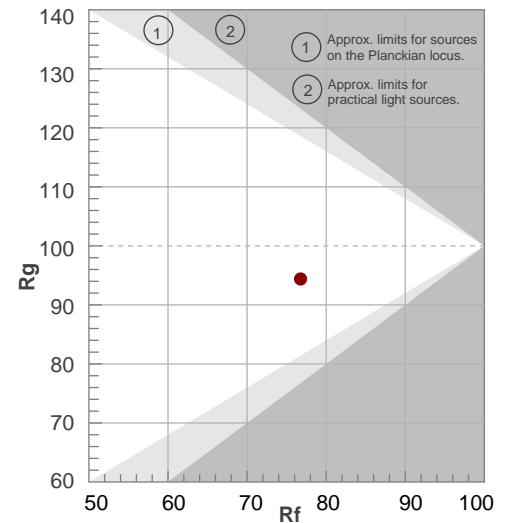
## Rf 76.8

Fidelity index Rf

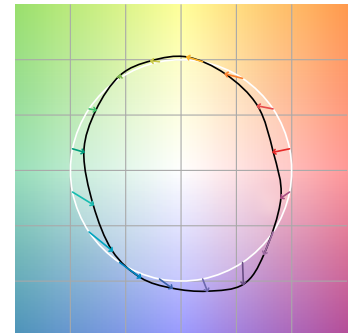
## Rg 94.4

Gamut index Rg

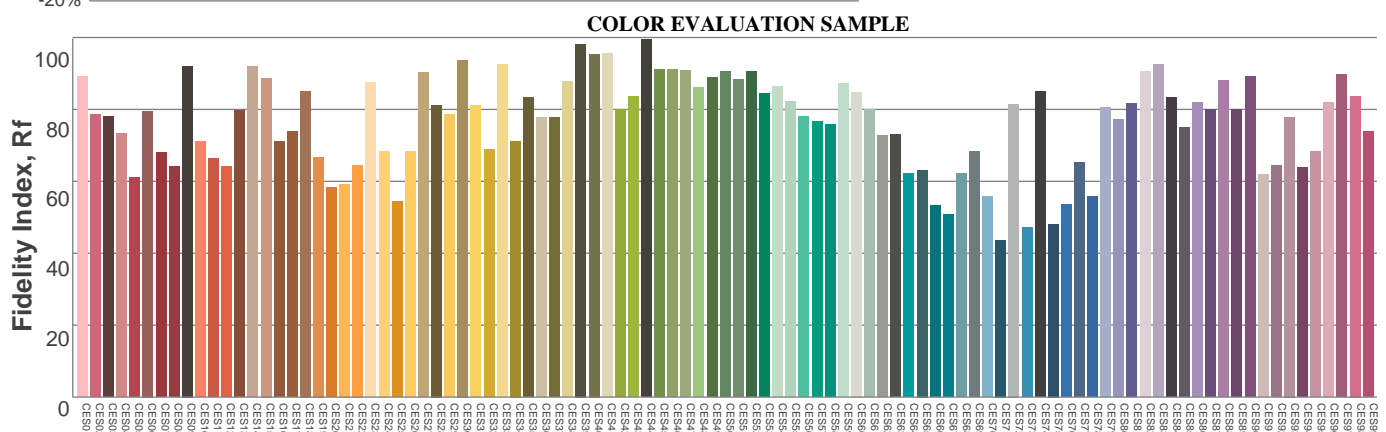
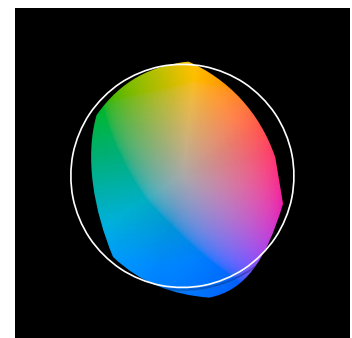
|         |       | Graphic shifts (%) |      |
|---------|-------|--------------------|------|
| Hue Bin | $R_f$ | Chroma             | Hue  |
| 1       | 72    | -15%               | 0%   |
| 2       | 75    | -10%               | 10%  |
| 3       | 73    | -5%                | 15%  |
| 4       | 76    | 2%                 | 15%  |
| 5       | 82    | 2%                 | 7%   |
| 6       | 91    | 2%                 | -2%  |
| 7       | 90    | -6%                | -3%  |
| 8       | 82    | -11%               | 1%   |
| 9       | 75    | -16%               | 15%  |
| 10      | 60    | -8%                | 26%  |
| 11      | 59    | 1%                 | 23%  |
| 12      | 79    | 6%                 | 13%  |
| 13      | 84    | 12%                | 2%   |
| 14      | 77    | 17%                | -10% |
| 15      | 73    | 4%                 | -21% |
| 16      | 84    | -7%                | -7%  |



## COLOR VECTOR GRAPHICS



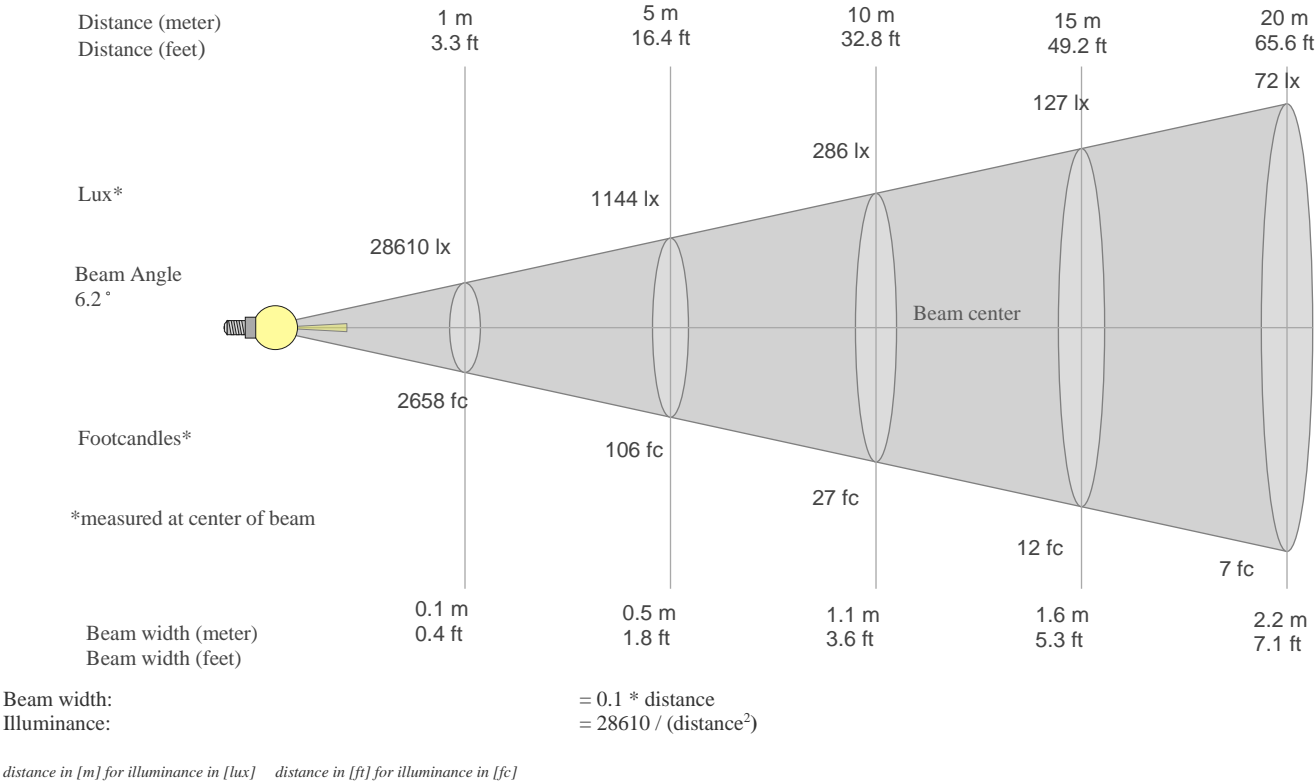
## COLOR DISTORTION GRAPHICS



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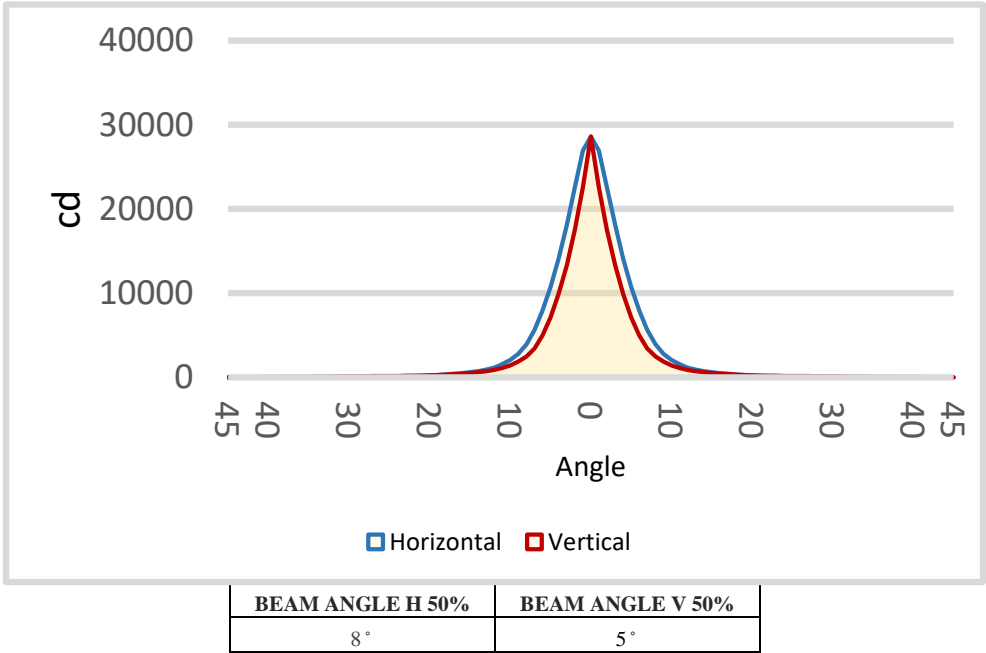
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### BEAM DETAILS



### BEAM ILLUMINANCE FROM 1-20M

| 1m      | 2m      | 3m      | 4m      | 5m      | 6m     | 7m     | 8m     | 9m     | 10m    | 11m    | 12m    | 13m    | 14m    | 15m    | 16m    | 17m    | 18m    | 19m    | 20m    |
|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 3.3ft   | 6.6ft   | 9.8ft   | 13.1ft  | 16.4ft  | 19.7ft | 23ft   | 26.2ft | 29.5ft | 32.8ft | 36.1ft | 39.4ft | 42.7ft | 45.9ft | 49.2ft | 52.5ft | 55.8ft | 59.1ft | 62.3ft | 65.6ft |
| 28610lx | 7152lx  | 3179lx  | 1788lx  | 1144lx  | 795lx  | 584lx  | 447lx  | 353lx  | 286lx  | 236lx  | 199lx  | 169lx  | 146lx  | 127lx  | 112lx  | 99lx   | 88lx   | 79lx   | 72lx   |
| 2658fc  | 664.5fc | 295.3fc | 166.1fc | 106.3fc | 73.8fc | 54.2fc | 41.5fc | 32.8fc | 26.6fc | 22fc   | 18.5fc | 15.7fc | 13.6fc | 11.8fc | 10.4fc | 9.2fc  | 8.2fc  | 7.4fc  | 6.6fc  |



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## TEST INFORMATION

Test date: From February 13, 2023, to February 21, 2023

Date of receipt samples: February 21, 2023

Quantity of receipt samples: 1 unit per model

## EQUIPMENT LIST

| ID  | Instrument | Model     | Cal. date   | Next cal. Date |
|---|------------|-----------|-------------|----------------|
| AC Power Meter  | EF-I-0287  | PF9811    | 2022.03.08  | 2023.03.07     |
| AC Power Meter  | EF-I-1002  | PF2010    | 2022.03.08  | 2023.03.07     |
| Photometric colorimetric electric system (2 meter sphere) | EF-I-900   | HASS 2000 | Before used | Before used    |
| 21V/3.9289A standard lamp                                 | EF-I-963   | D204      | 2022.11.22  | 2023.11.21     |
| Goniophotometer   | EF-I-902   | GO-R5000  | 2022.03.08  | 2023.03.07     |
| Wireless temperature transmitter                          | EF-I-958   | DWRP-B(0) | 2022.03.08  | 2023.03.07     |

## REFERENCE STANDARDS OR METHODS

ANSI/NEMA/ ANSLG C78.377-2017 Specifications for the Chromaticity of Solid State Lighting Products

ANSI C82.77-2002 Harmonic Emission Limits Related Power Quality Requirements for Lighting Equipment

CIE Pub. No. 13.3-1995 Method of Measuring and Specifying Color Rendering of Light Sources

CIE Pub. No. 15:2004 Colorimetry

IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products

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## TEST CONDUCTED AND METHOD

### Ambient Condition

The ambient temperature in which measurements are being taken was maintained at  $25 \pm 2$  °C, the air flow around the sample(s) being tested did not affect the performance.

### Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within 0.2 percent under load.

### Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

### Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent (9% confidence interval,  $k=2$ ).

### Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

10 samples were measured as customer required.

### Total Luminous Flux Measurement Method

Total luminous flux was measured by both sphere-spectroradiometer system and goniophotometer.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

1 sample was measured by sphere method, and 1 sample was measured by goniophotometer method.

Correction factor (self-absorption) has been considered when doing measurement.

### Luminous Intensity Distribution Measurement Method

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

1 sample was measured as customer required.