



Date of issue 2021-02-01

Version 1.0

Total pages 39

Test report of

IES LM-79-08

Approved Method: Electrical and Photometric

Measurements of Solid-State Lighting Products

Applicant:

LIGHT EFFICIENT DESIGN

Address:

188 S. Northwest Highway Cary, IL 60013 USA

For Product:

Linear Replacement Lamps -- 4' T5/T5HO Lamps--3-lamp External Driver (UL Type C) Lamps

Product Model No.:

RP-T5C-G2-50W-4FT-3L-830-[OCN, Blank]-10V,
RP-T5C-G2-50W-4FT-3L-850-[OCN, Blank]-10V,
RP-T5C-G2-60W-4FT-3L-830-[OCN, Blank]-10V,
RP-T5C-G2-60W-4FT-3L-850-[OCN, Blank]-10V,
RP-T5C-G2-70W-4FT-3L-830-[OCN, Blank]-10V,
RP-T5C-G2-70W-4FT-3L-850-[OCN, Blank]-10V,
RP-T5CHO-G2-80W-4FT-3L-830-[OCN, Blank]-10V,
RP-T5CHO-G2-80W-4FT-3L-850-[OCN, Blank]-10V

Test laboratory: Shenzhen Belling Efficiency Testing Lab Co.,Ltd, 1Floor, No.1 Building, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov.518101 China.

Jarvis zhang

Jason zhou

Complied by: Jarvis zhang

Review by: Jason zhou

Project Engineer

Technical Manager

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Belling Efficiency Testing Lab Co.,Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP, NIST, or any agency of the U.S. Government.



1 General

1.1 Product Information

| | |
|---------------------------------|---|
| Manufacturer | LIGHT EFFICIENT DESIGN |
| Manufacturer Address | 188 S. Northwest Highway Cary, IL 60013 USA |
| Brand Name | REMPHOS OR LIGHT EFFICIENT DESIGN |
| Luminaire Type | Linear Replacement Lamps -- 4' T5/T5HO Lamps--3-lamp External Driver (UL Type C) Lamps |
| Test Model Number | RP-T5C-G2-50W-4FT-3L-830-[OCN, Blank]-10V, RP-T5C-G2-50W-4FT-3L-850-[OCN, Blank]-10V, RP-T5C-G2-60W-4FT-3L-830-[OCN, Blank]-10V, RP-T5C-G2-60W-4FT-3L-850-[OCN, Blank]-10V, RP-T5C-G2-70W-4FT-3L-830-[OCN, Blank]-10V, RP-T5C-G2-70W-4FT-3L-850-[OCN, Blank]-10V, RP-T5CHO-G2-80W-4FT-3L-830-[OCN, Blank]-10V, RP-T5CHO-G2-80W-4FT-3L-850-[OCN, Blank]-10V |
| Rated Inputs | AC 100-277V 50/60Hz |
| Field-Adjustable Product | Yes, Wattage setting: 50W, 60W, 70W, 80W |
| Nominal CCT | 3000K, 5000K |
| Dimming Capability | Continuous |
| Integral Control Sensors | Optional |
| Date of Receipt Samples | 2020-12-21 |
| Date of test | 2020-12-22 to 2021-01-21 |
| Burning Time Before Test | 0hour(For New Products) |

1.2 Standards or methods

- ANSI C78.377-2017:Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-10:2014:Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment - Solid State
- CIE Publication No.13.3-1995:Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products



1.3 Equipment list

| Device | Manufacture | Model No. | Serial No. | Calibration due date |
|---|-------------|-----------|-------------|----------------------|
| Goniophotometric System | SENSING | GMS-3000 | N.A | 2021-04-02 |
| AC Power Source | ALL POWER | APW-110N | 992257 | 2021-04-02 |
| Total Luminous Flux Standard Lamp | SENSING | 110V/100W | S1510065 | 2021-04-08 |
| Total Spectral Radiant Flux Standard Lamp | SENSING | 12V/20W | LSD12201731 | 2021-04-08 |
| Digital Power Meter | YOKOGAWA | WT310 | C2QM02030V | 2021-04-02 |
| Integral Sphere | SENSING | SPR-600M | N.A | 2021-04-02 |
| Digital Power Meter | YOKOGAWA | WT210 | 91L929742 | 2021-04-02 |
| Optical Color and Electrical Measurement System | SENSING | SPR-3000 | S1101108 | 2021-04-02 |
| Environment Measurer | XUYAO | HS-1 | N/A | 2021-04-08 |
| Environment Measurer | XUYAO | HS-1 | N/A | 2021-04-08 |
| Stop watch | KISLO | K610 | N/A | 2021-04-27 |
| Digital Anemometer | TECMAN | TD8901 | 026141 | 2021-09-09 |

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab Co.,Ltd attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).



2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the air flow around the sample(s) being tested did not affect the performance.

2.2 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.

2.3 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).

2.4 Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards. 4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

Integrating Sphere Uncertainty: The uncertainty of the light output (luminous flux) measurements is $U=1.8\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=20\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=1.8(K=2)$, at the 95% confidence level. The uncertainty of power meter AC current $U=0.18\%$ of rdg, AC Voltage $U=0.16\%$ of rdg, Power $U=0.20\%$ ($K=2$), at the 95% confidence level.



2.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.

Goniophotometer Uncertainty :The uncertainty of the luminous intensity is $U=1.6\%$ ($K=2$), at the 95% confidence level.



3 Test Result Summary

3.1 Integrating Sphere System (Total operating time for integrating sphere test: 1.0 hour)

3.1.1 Model Number: RP-T5C-G2-50W-4FT-3L-830-[OCN, Blank]-10V

Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.16 | 60 | 0.144 | 17.26 | 0.997 |

Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 2138.93 | 123.9 | 3002 |

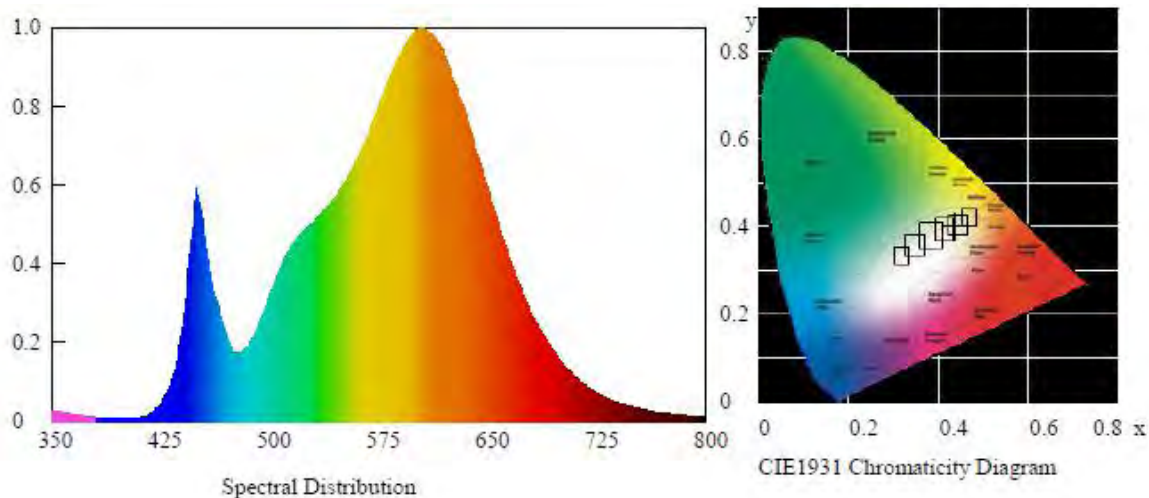
Chromaticity Coordinate

| Duv | x | y | u' | v' |
|---------|--------|--------|-------|--------|
| -0.0013 | 0.4349 | 0.4001 | 0.251 | 0.5195 |

Color Rendering

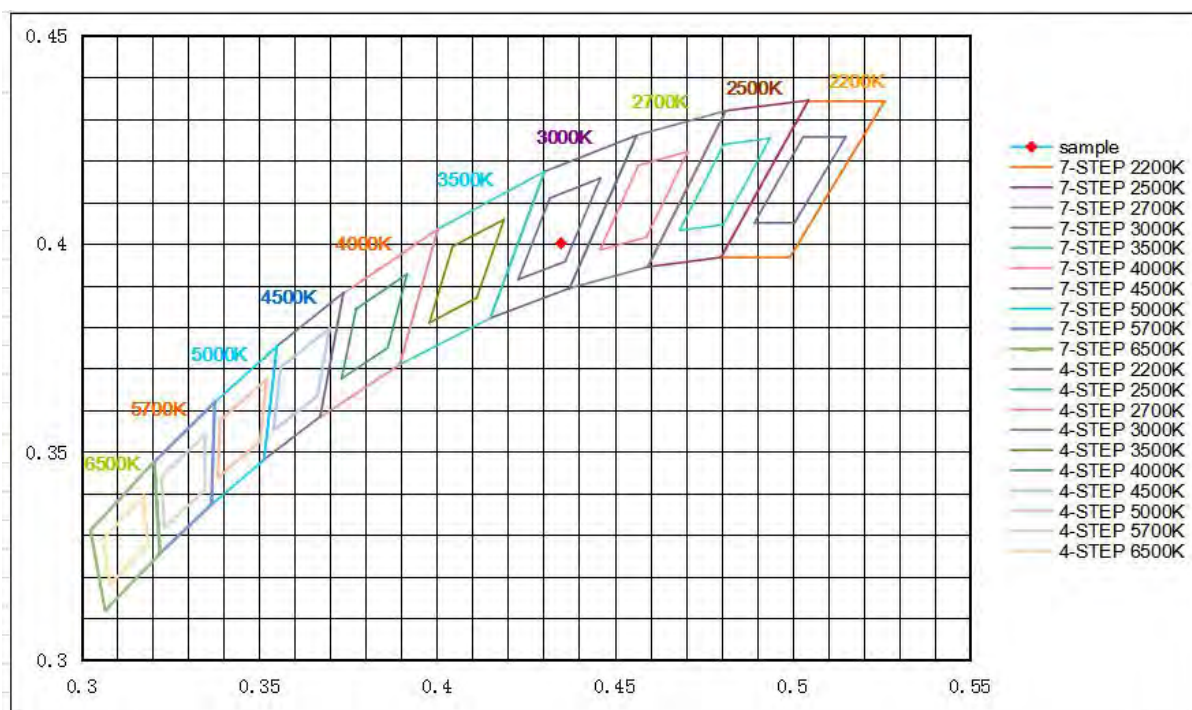
| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.9 | 12 | 85 | 97 | -11 |

Spectral Distribution





7/4 Step Quadrangle





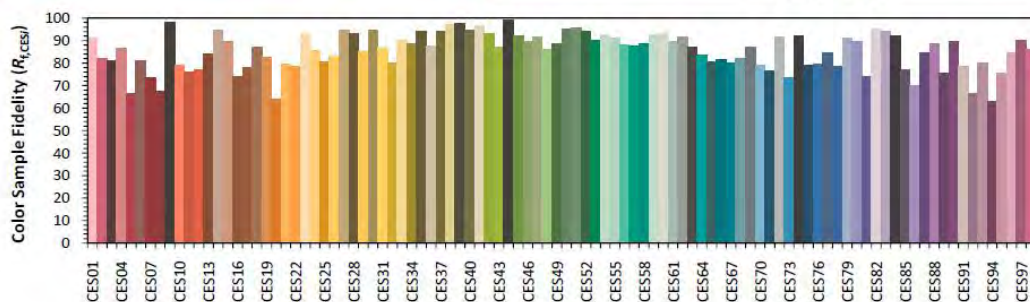
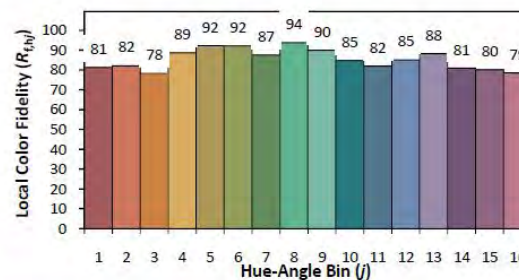
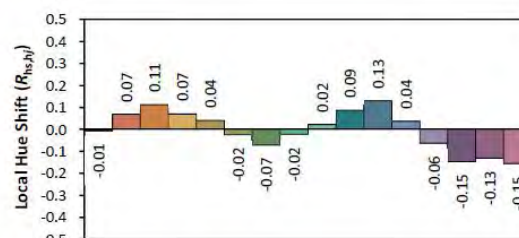
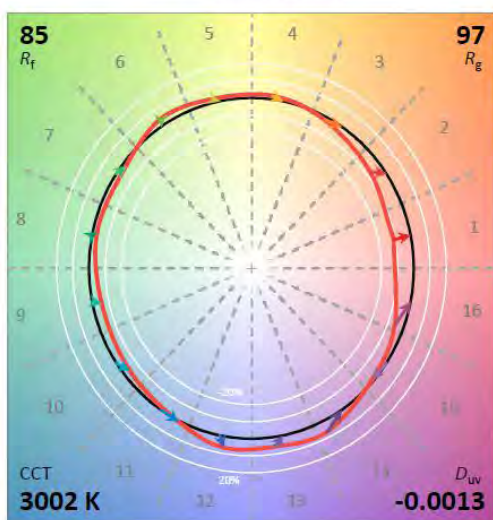
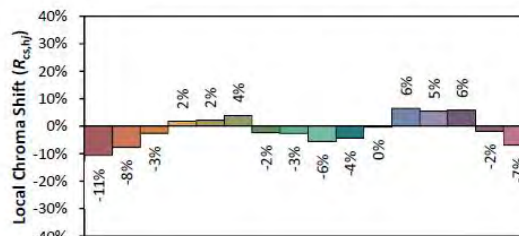
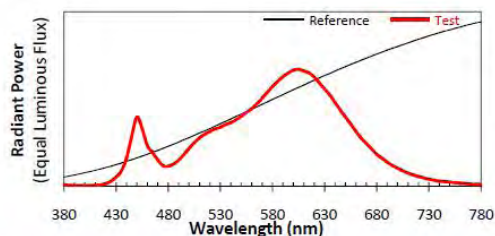
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5C-G2-50W-4FT-3L-830-[OCN, Blank]-10V



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

x 0.4349
 y 0.4001
 u' 0.2510
 v' 0.5195

CIE 13.3-1995
(CRI)

R_a 84
 R_g 12

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.2 Model Number: RP-T5C-G2-50W-4FT-3L-850-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.01 | 60 | 0.144 | 17.24 | 0.997 |

Photometric data

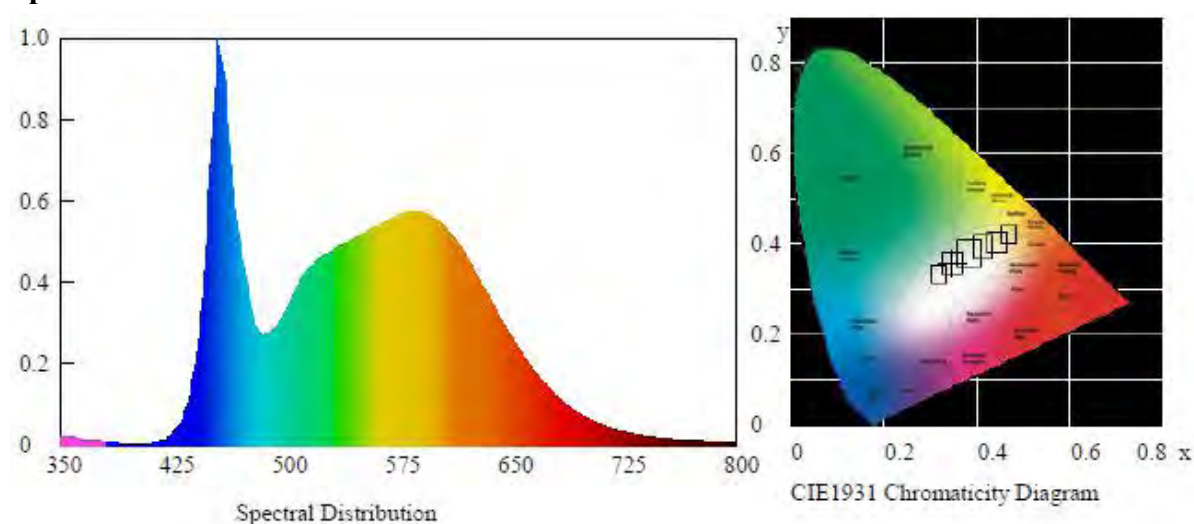
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 2188.18 | 126.9 | 4996 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|------|-------|
| +0.00206 | 0.3456 | 0.3562 | 0.21 | 0.487 |

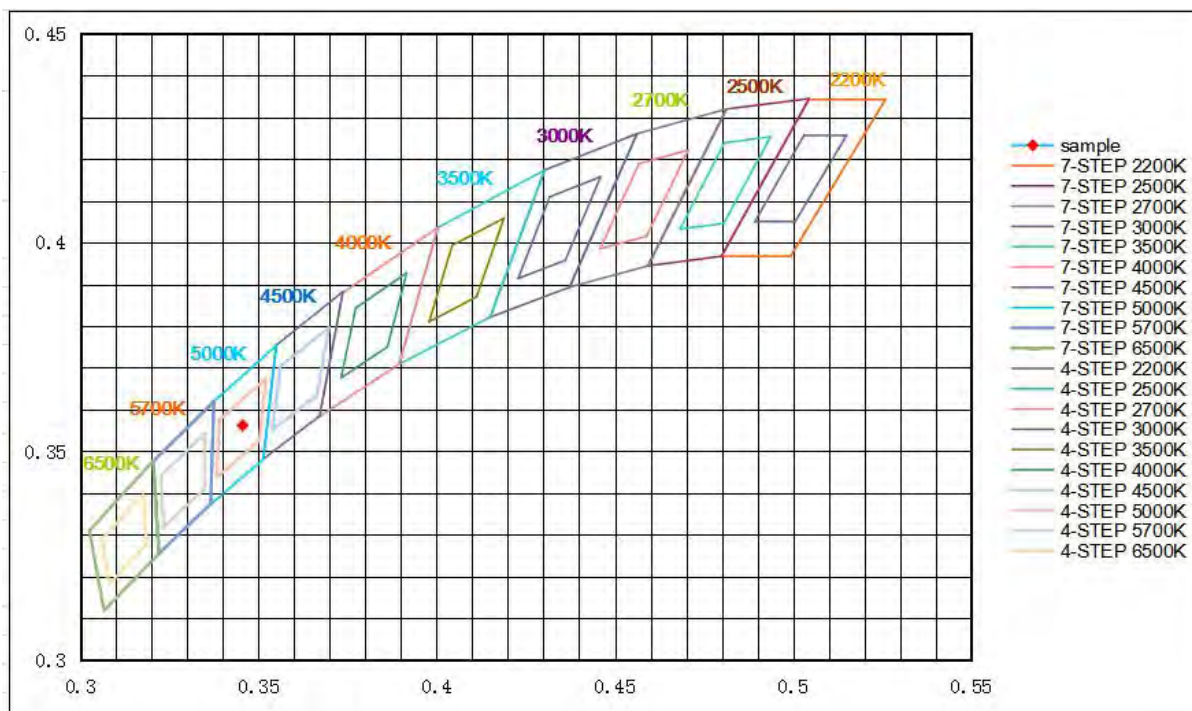
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 84.0 | 14 | 83 | 93 | -12 |

Spectral Distribution



7/4 Step Quadrangle





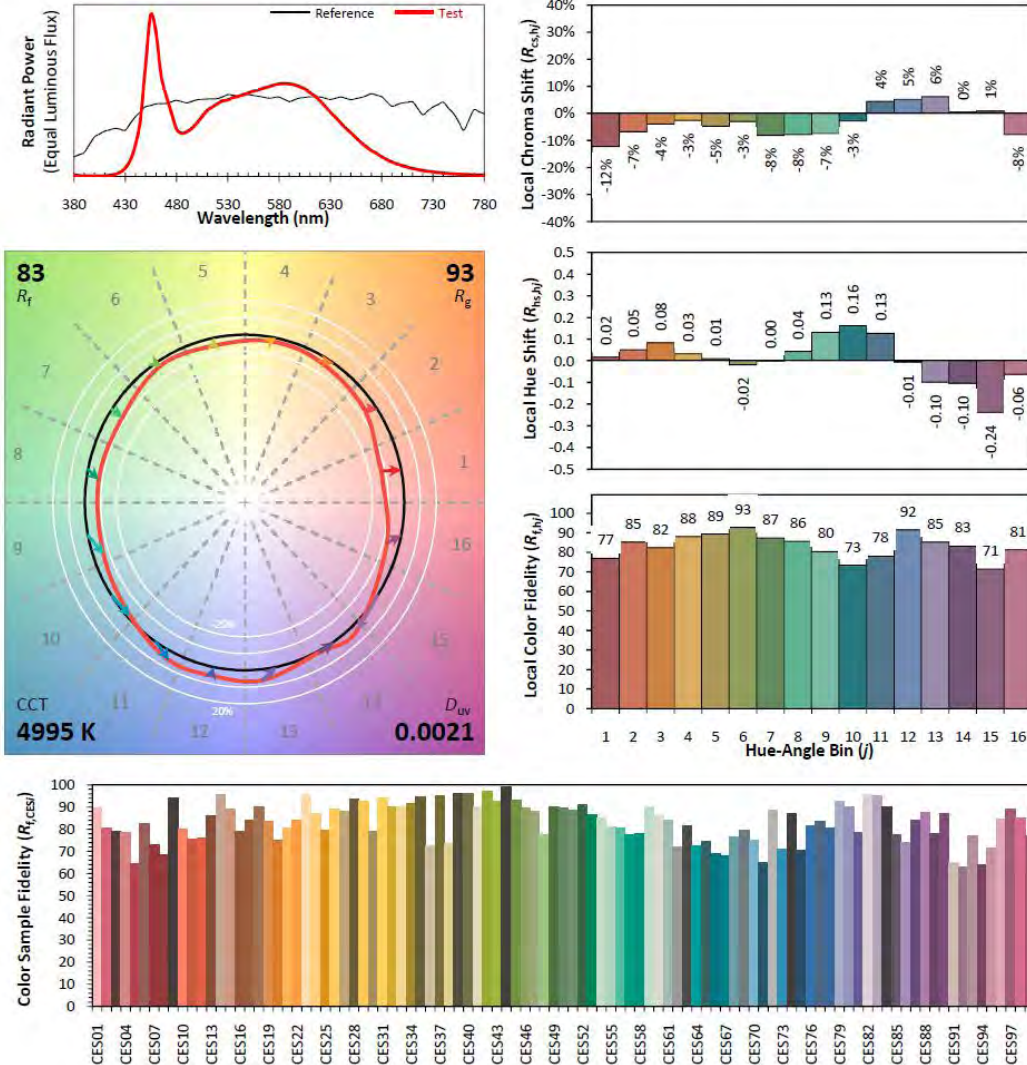
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5C-G2-50W-4FT-3L-850-[OCN, Blank]-10V



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

x 0.3456
 y 0.3562
 u' 0.2100
 v' 0.4870

CIE 13.3-1995
(CRI)

R_a 84
 R_g 14

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.3 Model Number: RP-T5C-G2-60W-4FT-3L-830-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.09 | 60 | 0.169 | 20.24 | 0.997 |

Photometric data

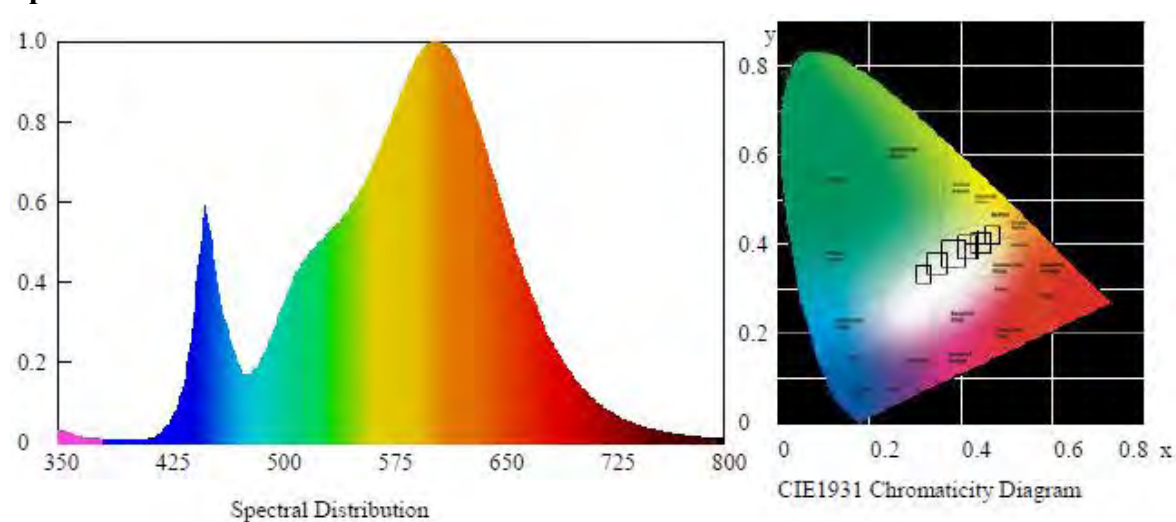
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 2471.71 | 122.1 | 2999 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|-------|--------|
| -0.00121 | 0.4353 | 0.4005 | 0.251 | 0.5197 |

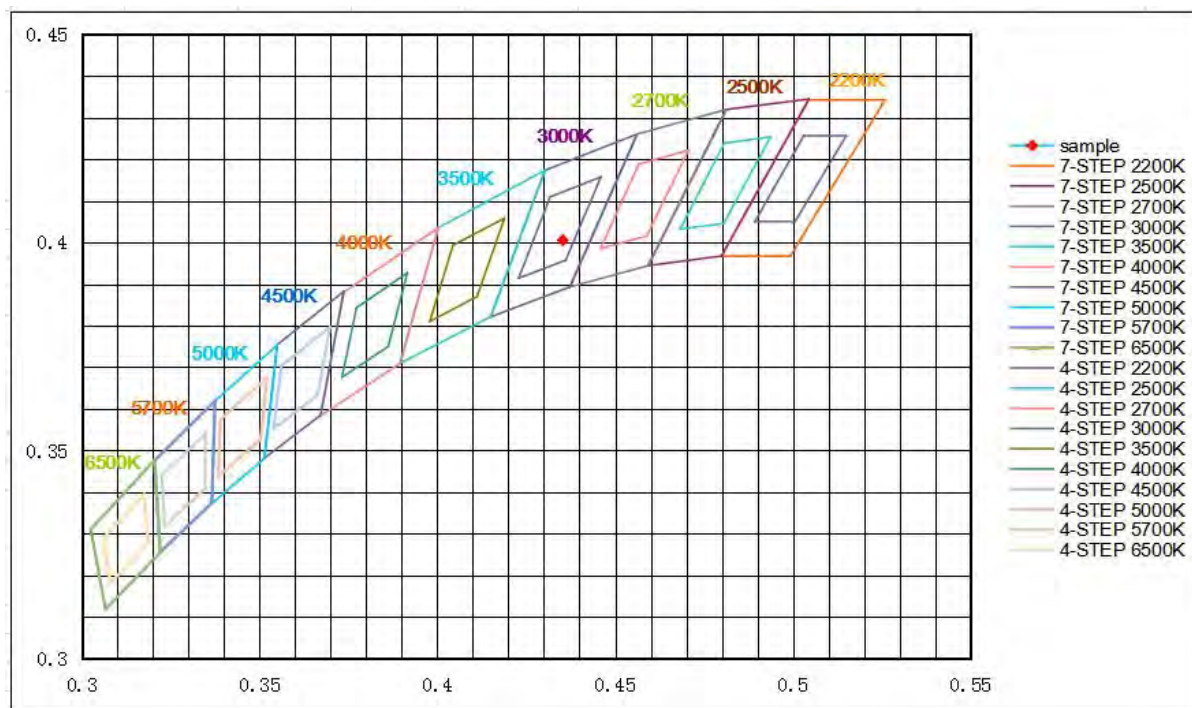
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.9 | 12 | 85 | 97 | -11 |

Spectral Distribution



7/4 Step Quadrangle





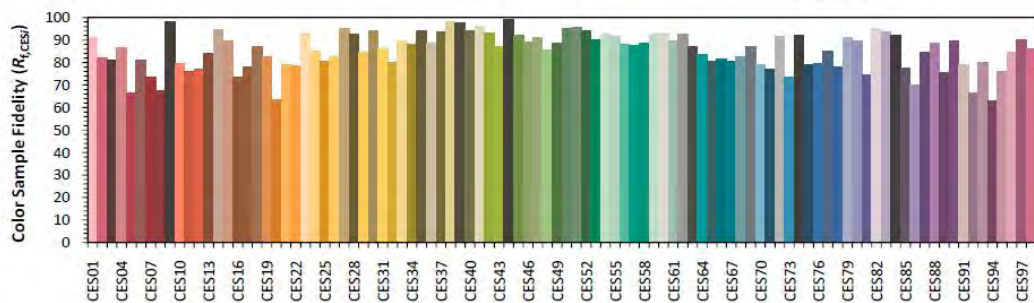
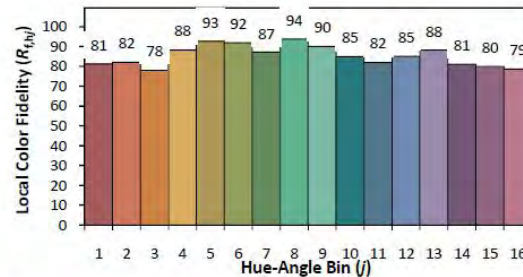
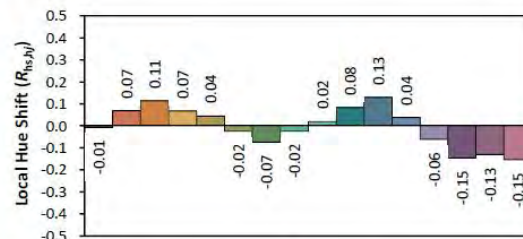
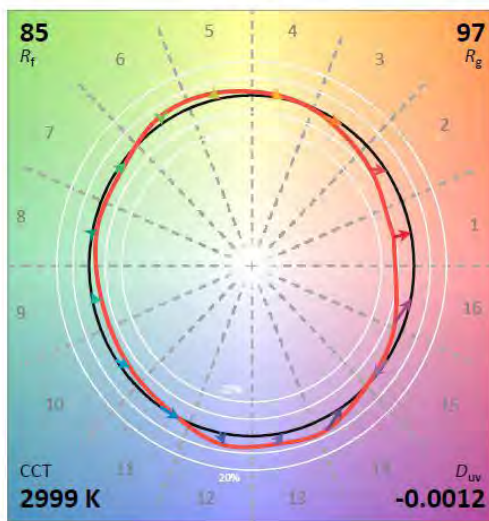
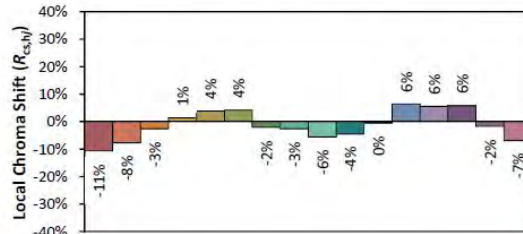
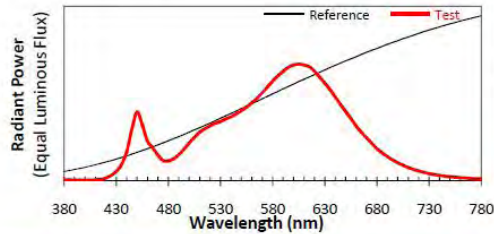
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Date: 2021/2/1

Manufacturer: LIGHT EFFICIENT DESIGN

Model: RP-T5C-G2-60W-4FT-3L-830-[OCN, Blank]-10V



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

x 0.4353
 y 0.4005
 u' 0.2510
 v' 0.5197

CIE 13.3-1995
(CRI)

R_a 84
 R_g 12

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.4 Model Number: RP-T5C-G2-60W-4FT-3L-850-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.00 | 60 | 0.169 | 20.20 | 0.997 |

Photometric data

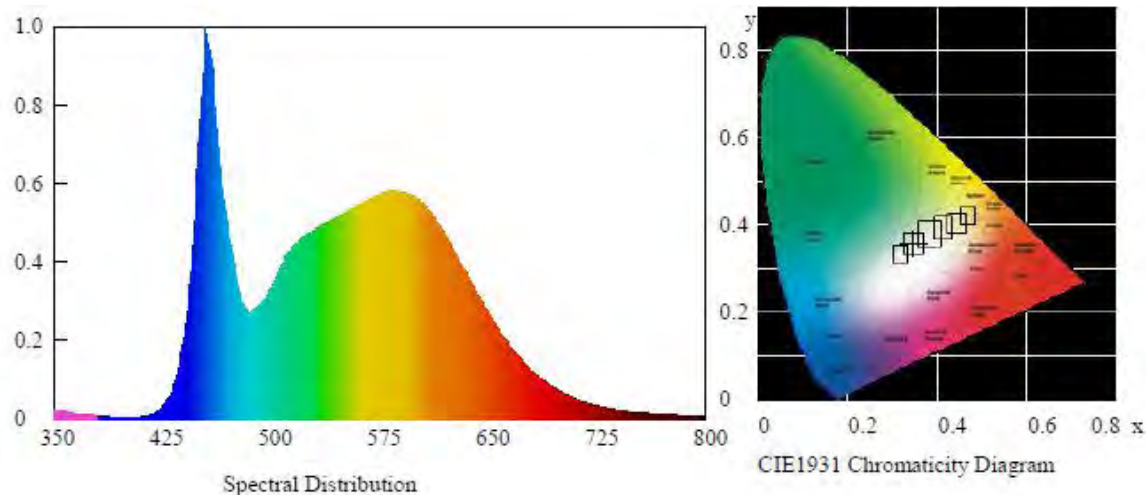
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 2533.08 | 125.4 | 4997 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|--------|--------|
| +0.00198 | 0.3456 | 0.3560 | 0.2101 | 0.4869 |

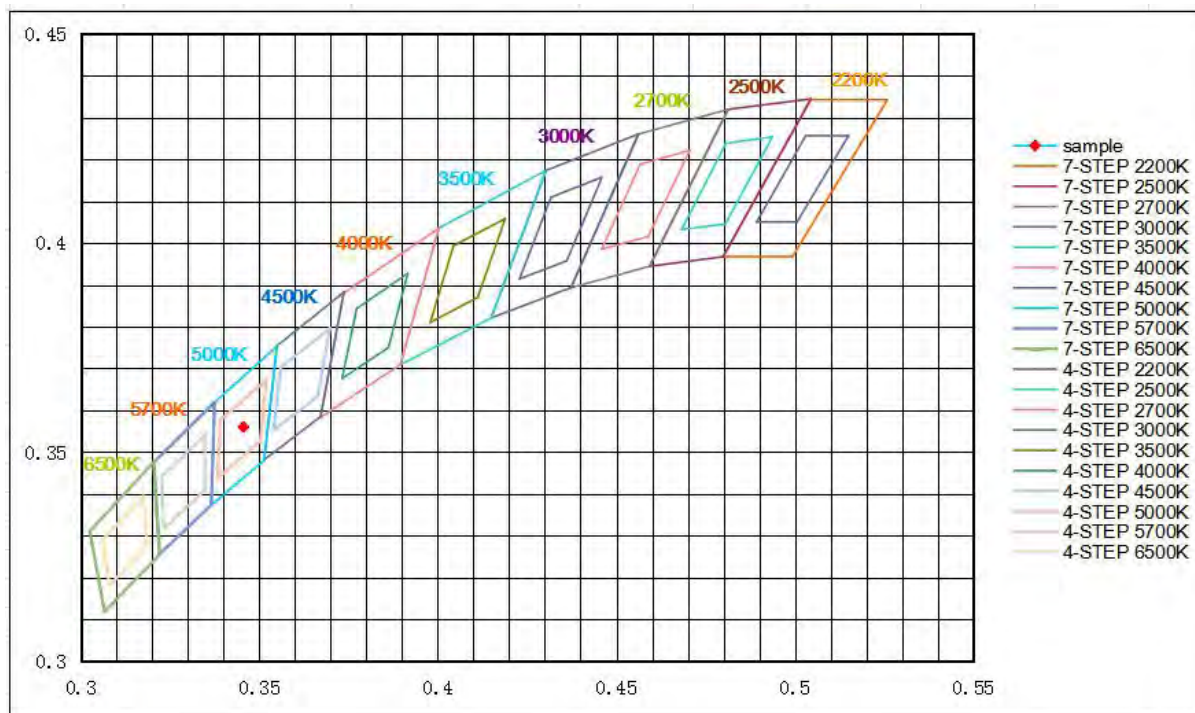
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 84.0 | 14 | 83 | 93 | -12 |

Spectral Distribution



7/4 Step Quadrangle





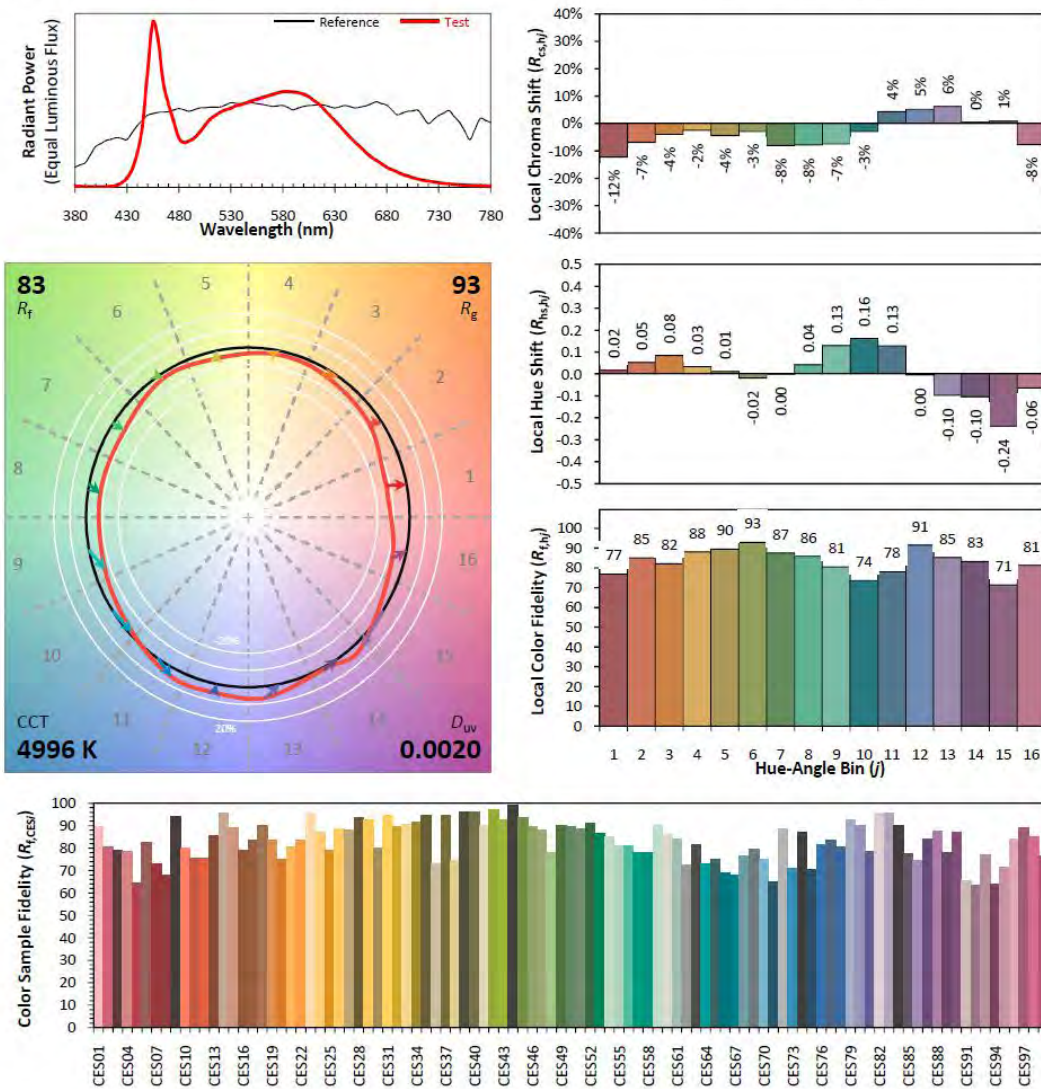
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5C-G2-60W-4FT-3L-850-[OCN, Blank]-10V



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

x 0.3456
 y 0.3560
 u' 0.2101
 v' 0.4869

CIE 13.3-1995
(CRI)

R_a 84
 R_9 14

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.5 Model Number: RP-T5C-G2-70W-4FT-3L-830-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.02 | 60 | 0.201 | 24.11 | 0.997 |

Photometric data

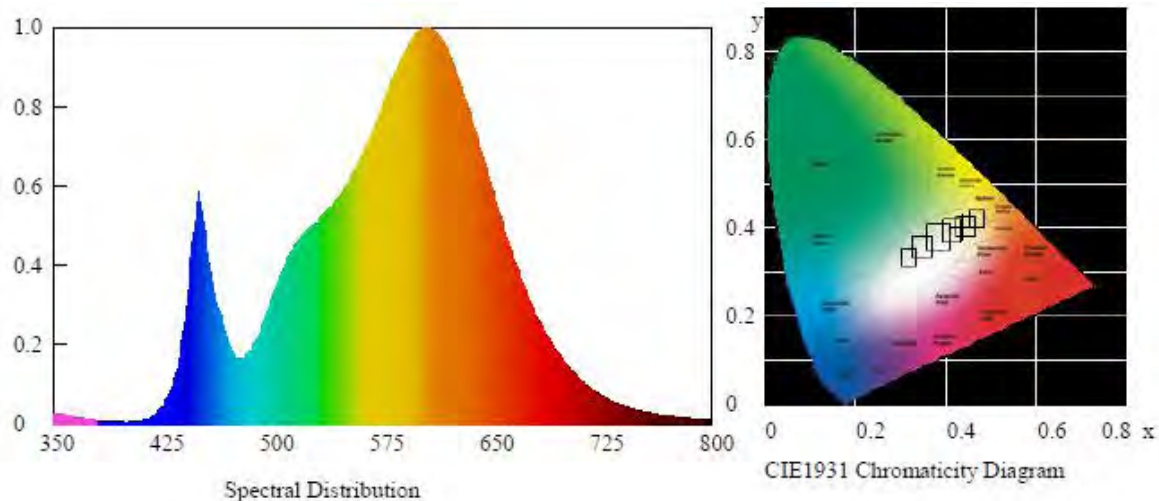
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 2929.77 | 121.5 | 2995 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|--------|--------|
| -0.00101 | 0.4358 | 0.4012 | 0.2511 | 0.5201 |

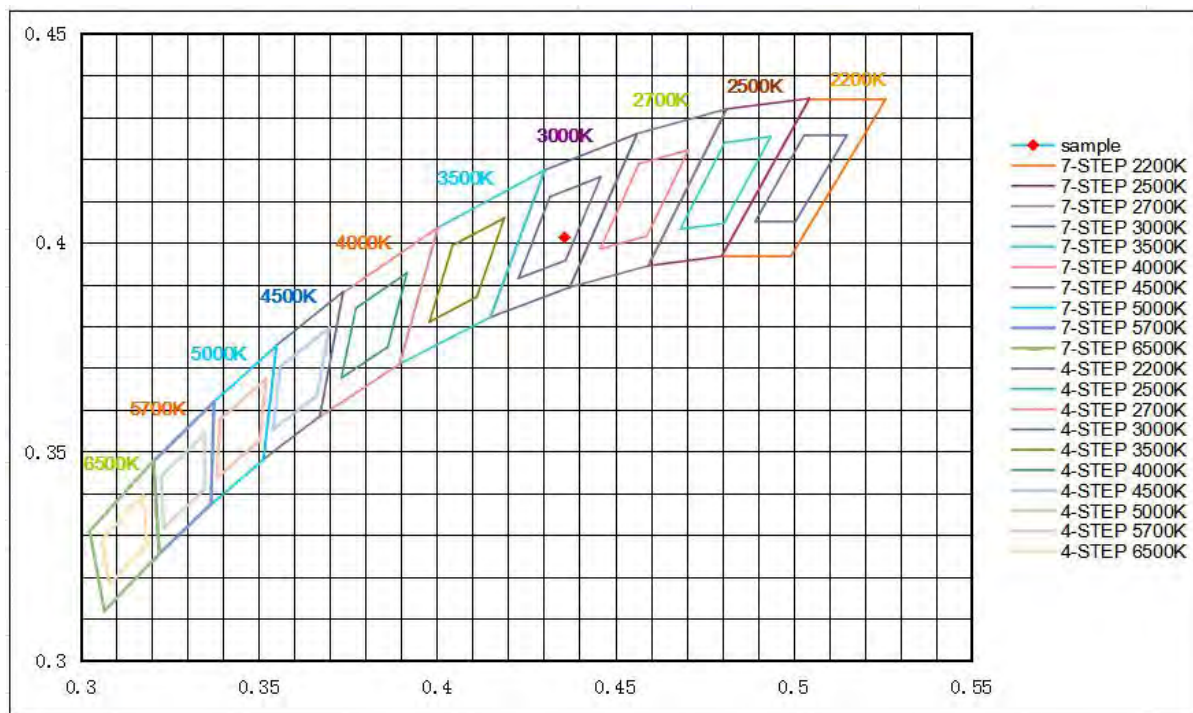
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.9 | 12 | 85 | 98 | -11 |

Spectral Distribution



7/4 Step Quadrangle





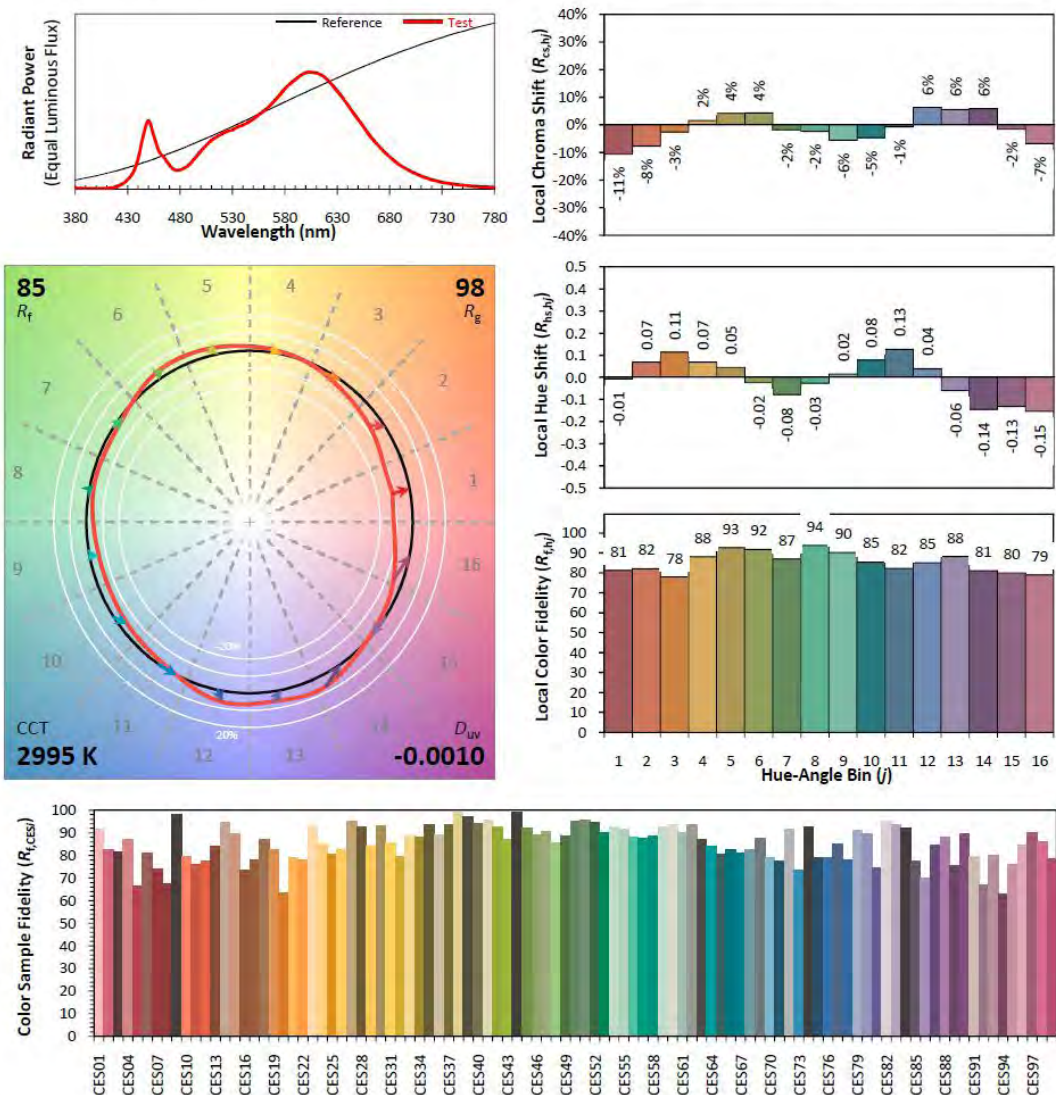
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5C-G2-70W-4FT-3L-830-[OCN, Blank]-10V



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

x 0.4358
 y 0.4012
 u' 0.2511
 v' 0.5201

CIE 13.3-1995
(CRI)

R_a 84
 R_g 12

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.6 Model Number: RP-T5C-G2-70W-4FT-3L-850-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.02 | 60 | 0.203 | 24.30 | 0.997 |

Photometric data

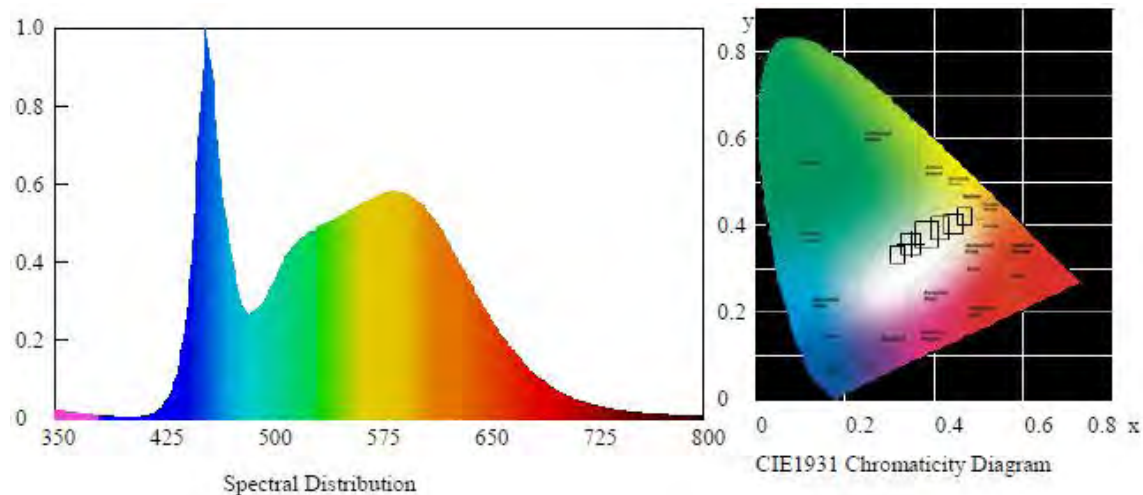
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 3025.77 | 124.5 | 4985 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|--------|--------|
| +0.00212 | 0.3460 | 0.3566 | 0.2101 | 0.4872 |

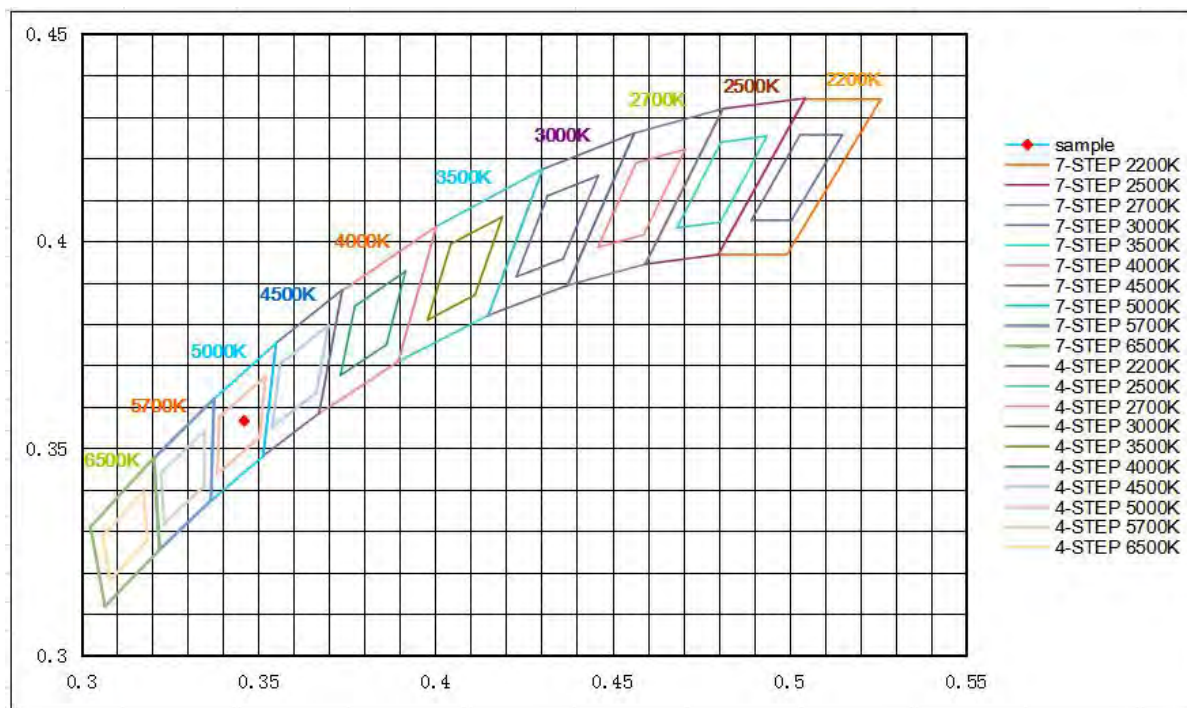
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.9 | 13 | 83 | 93 | -12 |

Spectral Distribution



7/4 Step Quadrangle





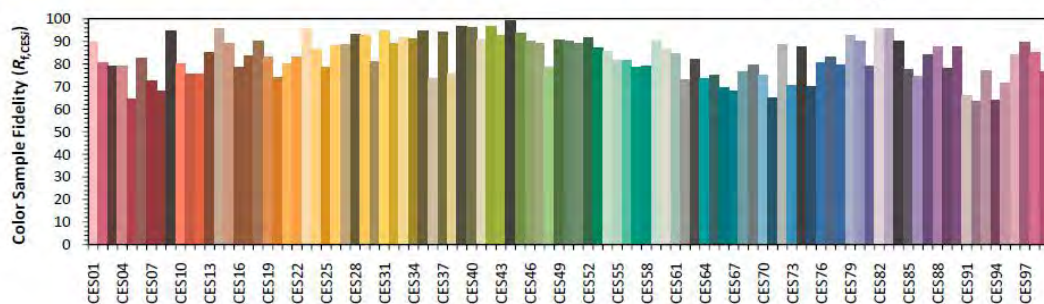
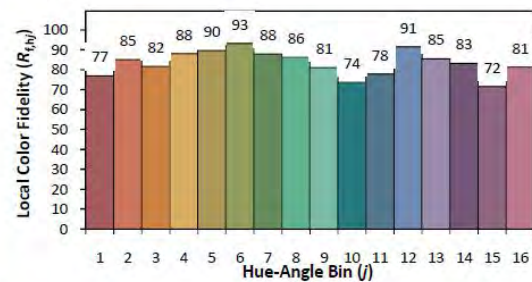
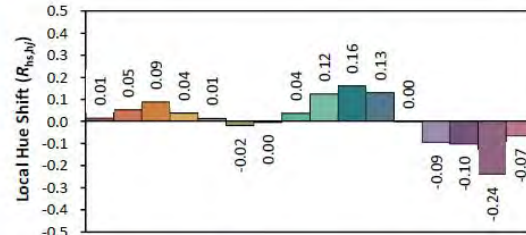
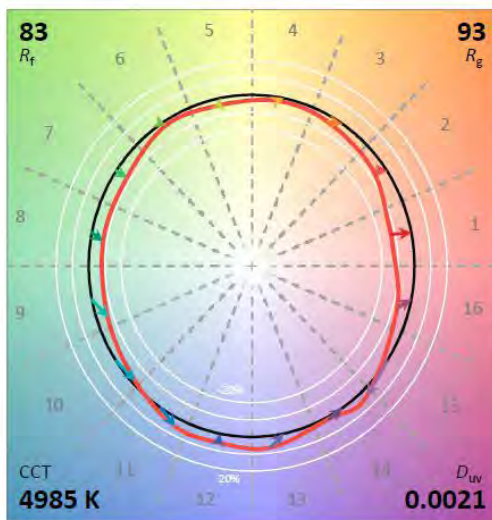
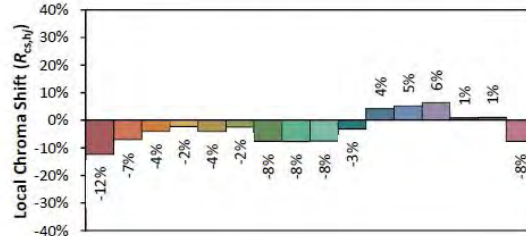
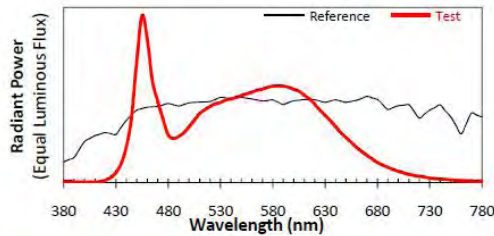
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5C-G2-70W-4FT-3L-850-[OCN, Blank]-10V



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

 x 0.3460 y 0.3565 u' 0.2101 v' 0.4872CIE 13.3-1995
(CRI) R_a 84 R_g 13

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.7 Model Number: RP-T5CHO-G2-80W-4FT-3L-830-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.00 | 60 | 0.224 | 26.77 | 0.995 |

Photometric data

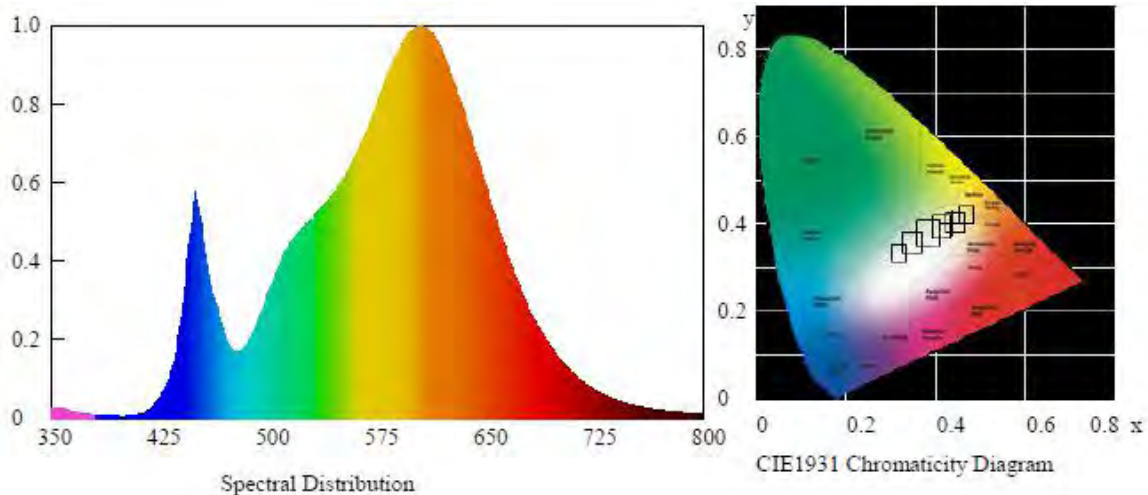
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 3240.37 | 121.0 | 3004 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|--------|--------|
| -0.00109 | 0.4351 | 0.4007 | 0.2508 | 0.5198 |

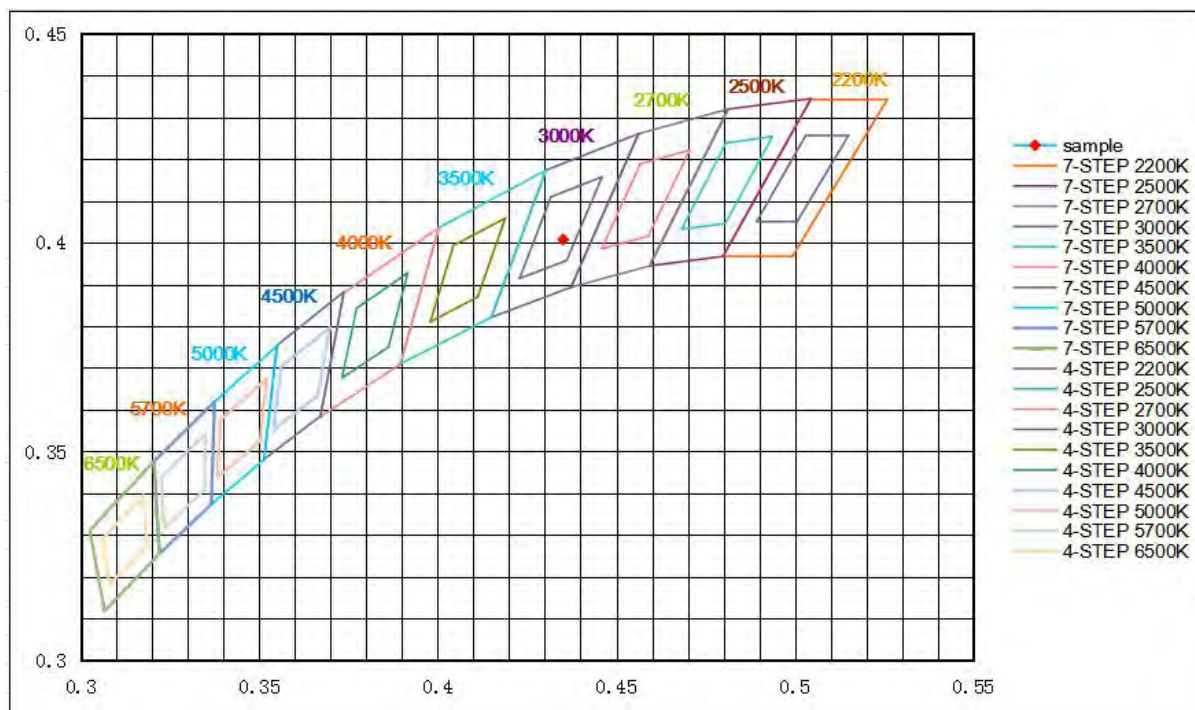
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.6 | 11 | 85 | 97 | -11 |

Spectral Distribution



7/4 Step Quadrangle





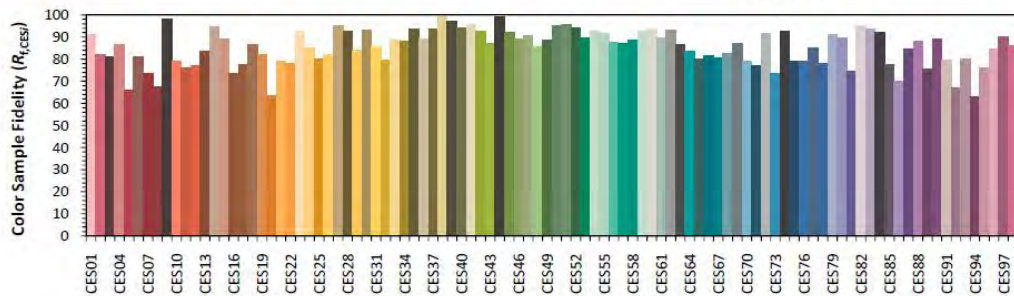
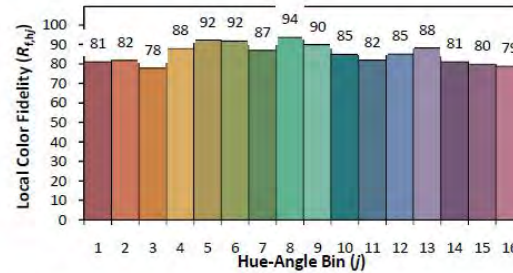
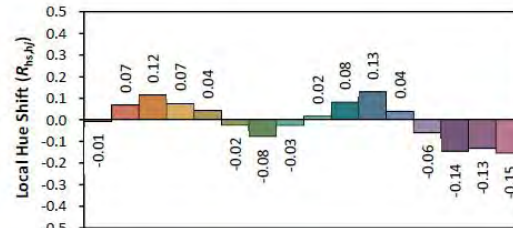
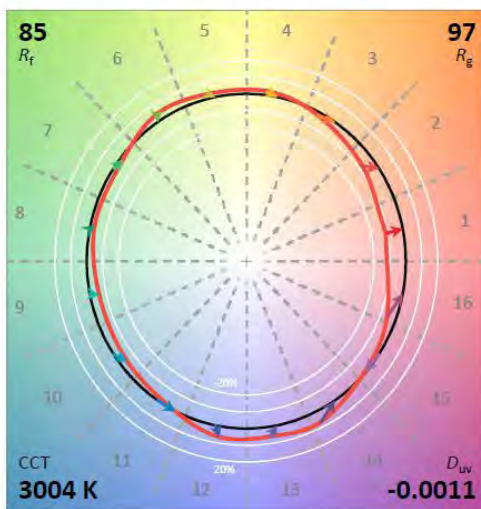
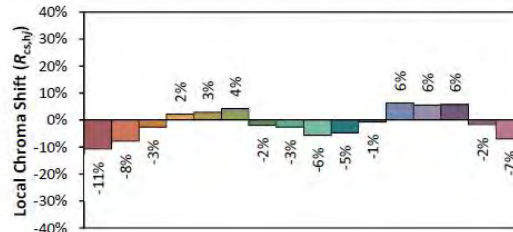
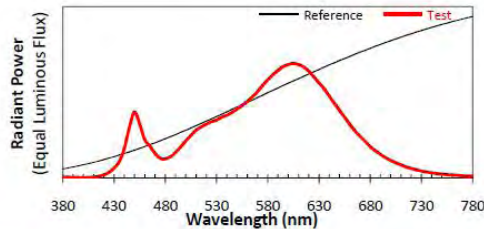
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5CHO-G2-80W-4FT-3L-830-[OCN, Blank]-10V



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

x 0.4351
 y 0.4007
 u' 0.2508
 v' 0.5198

CIE 13.3-1995
(CRI)

R_a 84
 R_g 11

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

**3.1.8 Model Number: RP-T5CHO-G2-80W-4FT-3L-850-[OCN, Blank]-10V****Electrical data**

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 119.94 | 60 | 0.224 | 26.74 | 0.995 |

Photometric data

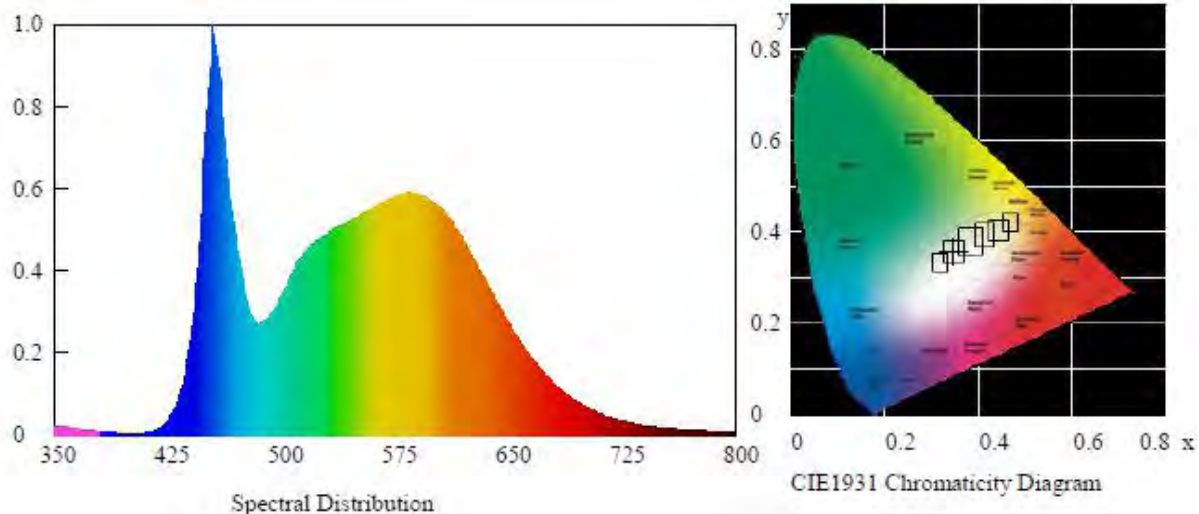
| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 3307.70 | 123.7 | 4994 |

Chromaticity Coordinate

| Duv | x | y | u' | v' |
|----------|--------|--------|------|-------|
| +0.00209 | 0.3457 | 0.3563 | 0.21 | 0.487 |

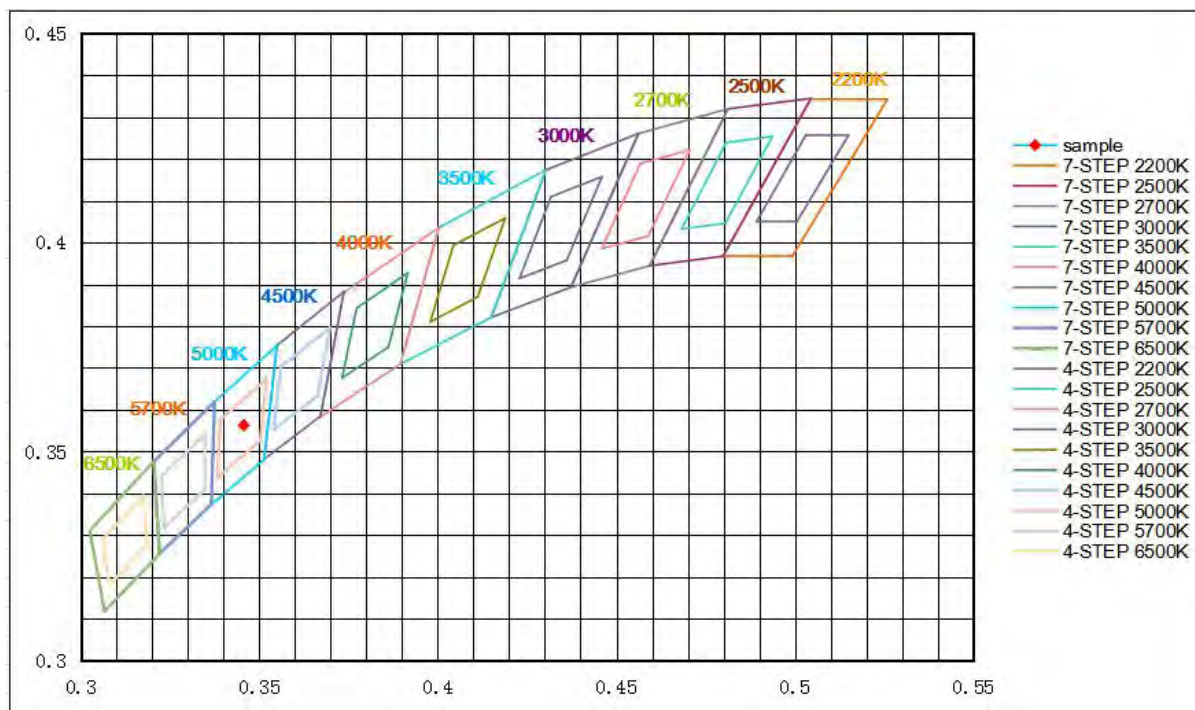
Color Rendering

| CRI | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.8 | 13 | 83 | 93 | -12 |

Spectral Distribution



7/4 Step Quadrangle





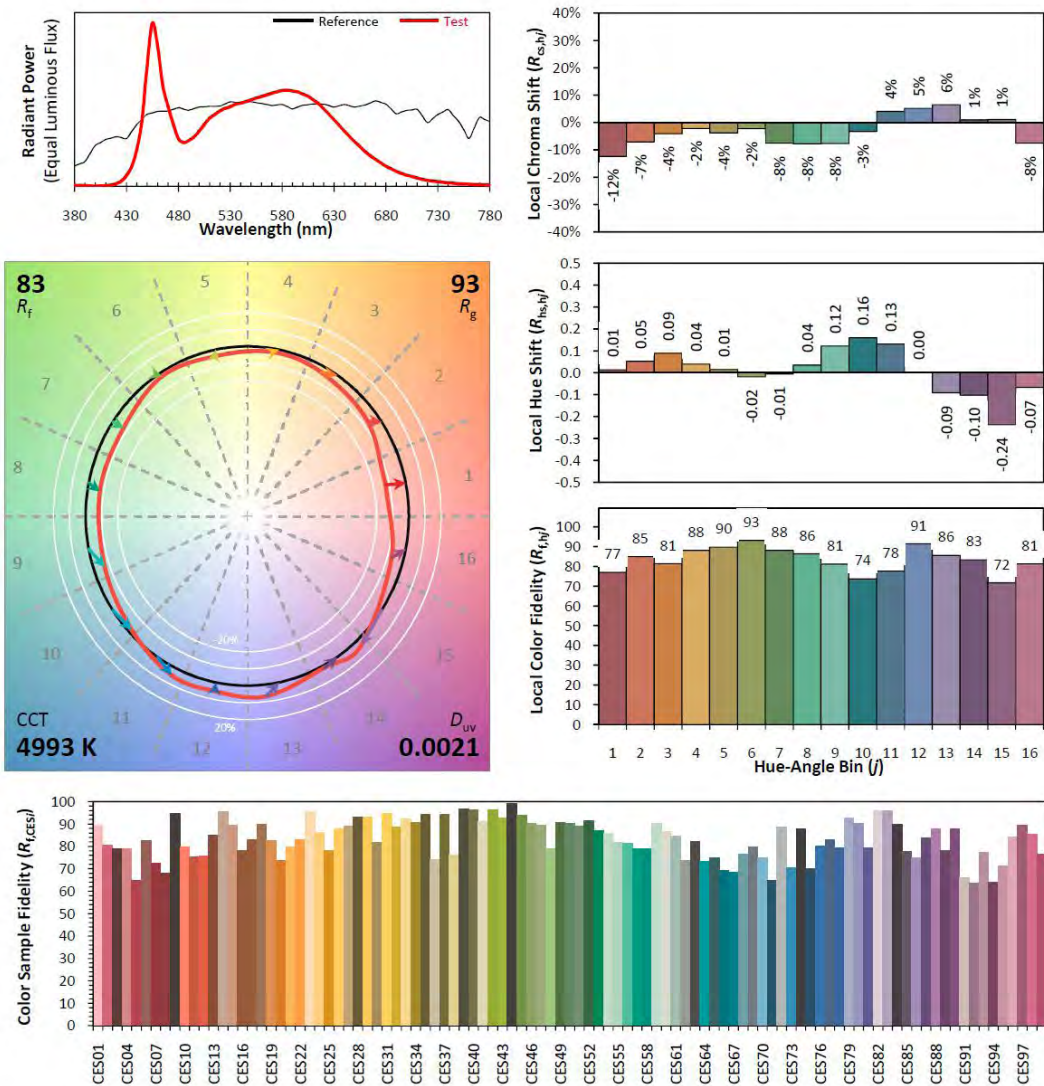
ANSI/IES TM-30-18 Color Rendition Report

Source: BL210201008-9

Manufacturer: LIGHT EFFICIENT DESIGN

Date: 2021/2/1

Model: RP-T5CHO-G2-80W-4FT-3L-850-[OCN, Blank]-10V



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

 x 0.3457 y 0.3563 u' 0.2100 v' 0.4870CIE 13.3-1995
(CRI) R_a 84 R_g 13

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



3.2 Goniophotometer System (Total operating time for luminous intensity distribution: 1.0 hour)

3.2.1 Model Number: RP-T5CHO-G2-80W-4FT-3L-830-[OCN, Blank]-10V

Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.06 | 60 | 0.225 | 26.76 | 0.9915 |

Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | Beam Angle (°) |
|--------------------|-----------------|----------------|
| 3249.25 | 121.42 | 188.8 |

**Zonal Flux Diagram**

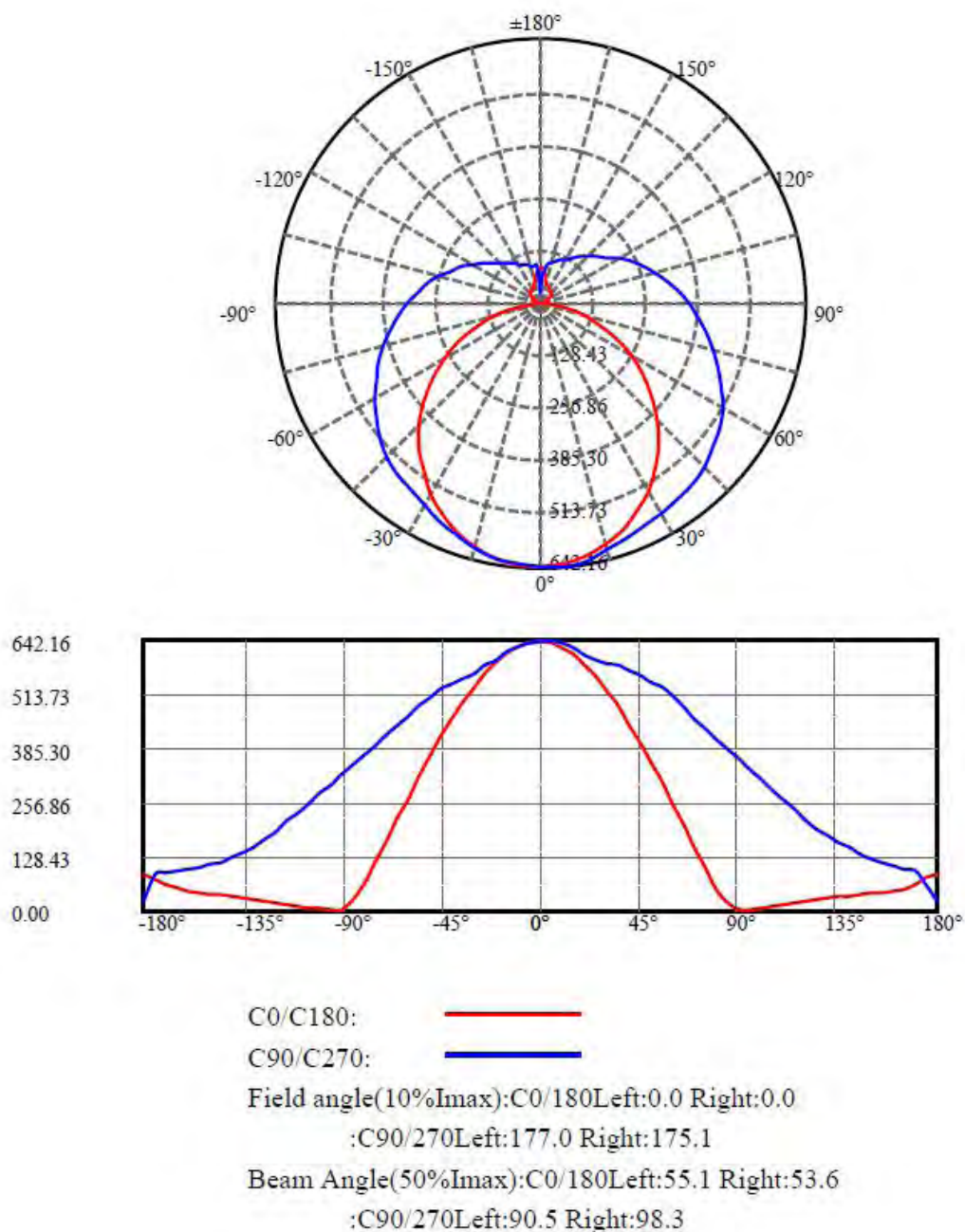
Zonal flux distribution table

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0 | 638.025 | 0.000 | 0 | 0.00% | 0.00% |
| 5.0 | 635.910 | 15.230 | 15.23 | 0.00% | 0.47% |
| 10.0 | 628.573 | 45.240 | 60.47 | 0.00% | 1.86% |
| 15.0 | 615.435 | 73.809 | 134.28 | 0.00% | 4.13% |
| 20.0 | 597.079 | 99.957 | 234.237 | 0.00% | 7.21% |
| 25.0 | 574.167 | 122.888 | 357.125 | 0.00% | 10.99% |
| 30.0 | 549.319 | 142.248 | 499.373 | 0.00% | 15.37% |
| 35.0 | 524.304 | 158.185 | 657.558 | 0.00% | 20.24% |
| 40.0 | 498.900 | 170.824 | 828.381 | 0.00% | 25.49% |
| 45.0 | 470.665 | 179.678 | 1008.06 | 0.00% | 31.02% |
| 50.0 | 440.086 | 184.221 | 1192.281 | 0.00% | 36.69% |
| 55.0 | 409.427 | 184.914 | 1377.195 | 0.00% | 42.39% |
| 60.0 | 378.221 | 182.267 | 1559.462 | 0.00% | 47.99% |
| 65.0 | 346.726 | 176.456 | 1735.918 | 0.00% | 53.43% |
| 70.0 | 314.112 | 167.561 | 1903.479 | 0.00% | 58.58% |
| 75.0 | 282.767 | 156.246 | 2059.725 | 0.00% | 63.39% |
| 80.0 | 253.183 | 143.639 | 2203.364 | 0.00% | 67.81% |
| 85.0 | 226.680 | 130.585 | 2333.949 | 0.00% | 71.83% |
| 90.0 | 204.336 | 118.092 | 2452.041 | 0.00% | 75.46% |
| 95.0 | 186.843 | 107.102 | 2559.143 | 0.00% | 78.76% |
| 100.0 | 170.807 | 97.156 | 2656.299 | 0.00% | 81.75% |
| 105.0 | 156.650 | 87.580 | 2743.879 | 0.00% | 84.45% |
| 110.0 | 143.235 | 78.348 | 2822.227 | 0.00% | 86.86% |
| 115.0 | 131.430 | 69.506 | 2891.733 | 0.00% | 89.00% |
| 120.0 | 117.070 | 60.367 | 2952.099 | 0.00% | 90.85% |
| 125.0 | 108.501 | 52.097 | 3004.196 | 0.00% | 92.46% |
| 130.0 | 101.827 | 45.692 | 3049.887 | 0.00% | 93.86% |
| 135.0 | 96.696 | 40.081 | 3089.968 | 0.00% | 95.10% |
| 140.0 | 93.140 | 35.120 | 3125.088 | 0.00% | 96.18% |
| 145.0 | 90.132 | 30.552 | 3155.64 | 0.00% | 97.12% |
| 150.0 | 87.043 | 26.073 | 3181.713 | 0.00% | 97.92% |
| 155.0 | 83.104 | 21.522 | 3203.234 | 0.00% | 98.58% |
| 160.0 | 80.060 | 17.103 | 3220.337 | 0.00% | 99.11% |
| 165.0 | 76.923 | 12.934 | 3233.271 | 0.00% | 99.51% |
| 170.0 | 73.438 | 8.917 | 3242.188 | 0.00% | 99.78% |
| 175.0 | 74.057 | 5.270 | 3247.457 | 0.00% | 99.94% |
| 180.0 | 75.629 | 1.788 | 3249.245 | 0.00% | 100.00% |



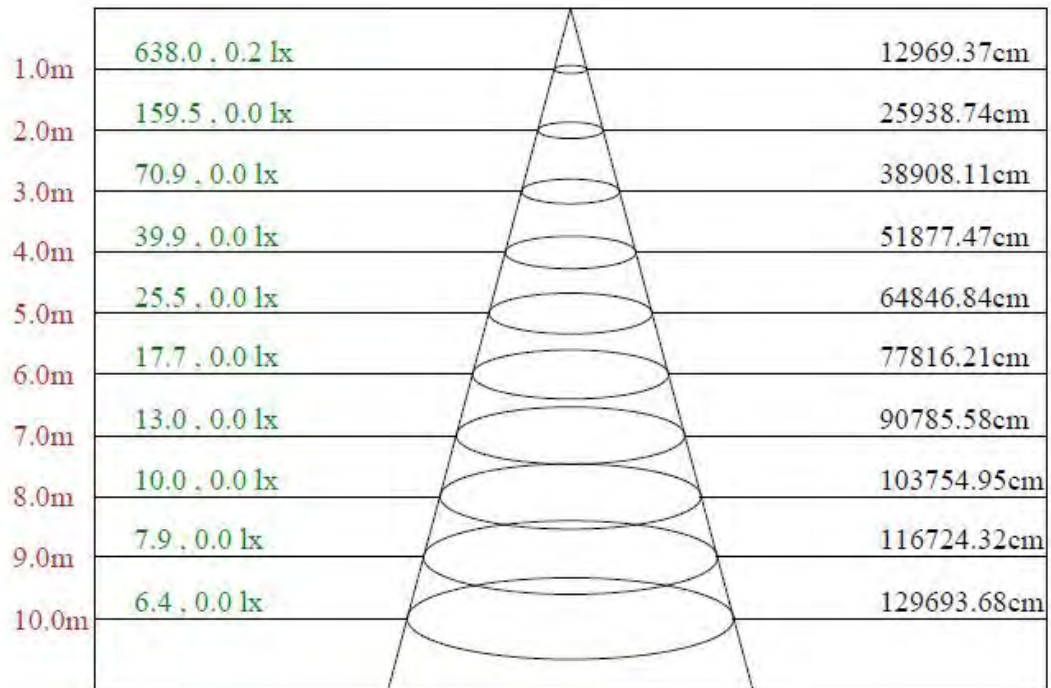
Luminous Intensity Distribution Diagram

Light Distribution Curve [Unit:cd]





Lux distance Curve



Max , Ave

Beam angle of C67.5 plane 178.23

**Luminous Intensity Distribution Data**

| C/γ(°) | 0.0 | 5.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.0 | 638.03 | 634.09 | 623.34 | 606.79 | 583.82 | 555.48 | 522.38 | 486.59 | 444.59 |
| 22.5 | 638.03 | 635.18 | 626.22 | 611.57 | 591.83 | 566.39 | 536.06 | 501.26 | 462.59 |
| 45.0 | 638.03 | 636.19 | 630.28 | 620.29 | 605.00 | 584.62 | 558.32 | 531.01 | 510.83 |
| 67.5 | 638.03 | 642.16 | 640.92 | 636.37 | 621.49 | 601.02 | 585.72 | 573.93 | 562.36 |
| 90.0 | 638.03 | 638.87 | 633.38 | 620.29 | 606.56 | 594.94 | 585.65 | 580.79 | 572.13 |
| 112.5 | 638.03 | 638.23 | 634.97 | 625.38 | 610.49 | 586.83 | 568.06 | 554.60 | 542.36 |
| 135.0 | 638.03 | 636.58 | 630.81 | 620.92 | 605.05 | 581.77 | 551.68 | 521.80 | 495.62 |
| 157.5 | 638.03 | 635.36 | 625.91 | 611.33 | 591.82 | 566.56 | 535.76 | 497.98 | 457.93 |
| 180.0 | 638.03 | 635.54 | 627.06 | 611.54 | 590.24 | 563.13 | 532.31 | 495.48 | 456.80 |
| 202.5 | 638.03 | 634.36 | 624.39 | 608.31 | 586.94 | 558.86 | 525.89 | 489.87 | 452.21 |
| 225.0 | 638.03 | 634.15 | 625.18 | 609.08 | 589.31 | 563.83 | 536.31 | 510.62 | 485.35 |
| 247.5 | 638.03 | 640.51 | 631.20 | 616.52 | 597.92 | 578.90 | 561.12 | 548.71 | 533.41 |
| 270.0 | 638.03 | 633.80 | 625.14 | 612.47 | 595.58 | 581.21 | 564.32 | 549.53 | 539.40 |
| 292.5 | 638.03 | 630.07 | 626.81 | 614.36 | 595.60 | 574.59 | 556.23 | 541.34 | 526.66 |
| 315.0 | 638.03 | 634.11 | 625.25 | 610.82 | 591.86 | 564.45 | 534.99 | 507.58 | 481.40 |
| 337.5 | 638.03 | 635.36 | 626.32 | 610.92 | 589.77 | 564.10 | 534.32 | 497.77 | 458.75 |
| 360.0 | 638.03 | 634.09 | 623.34 | 606.79 | 583.82 | 555.48 | 522.38 | 486.59 | 444.59 |
| C/γ(°) | 45.0 | 50.0 | 55.0 | 60.0 | 65.0 | 70.0 | 75.0 | 80.0 | 85.0 |
| 0.0 | 400.52 | 353.56 | 305.98 | 254.88 | 204.19 | 151.23 | 100.96 | 53.58 | 18.41 |
| 22.5 | 419.04 | 375.69 | 337.43 | 304.46 | 269.86 | 231.20 | 196.39 | 165.87 | 139.21 |
| 45.0 | 488.00 | 462.93 | 434.80 | 405.03 | 375.27 | 346.12 | 317.38 | 290.27 | 268.66 |
| 67.5 | 544.58 | 522.87 | 502.61 | 481.72 | 457.53 | 433.34 | 408.54 | 384.35 | 361.19 |
| 90.0 | 559.04 | 543.83 | 529.47 | 509.62 | 483.85 | 456.19 | 431.26 | 405.50 | 381.84 |
| 112.5 | 522.58 | 504.02 | 485.05 | 462.20 | 438.74 | 415.08 | 391.42 | 366.74 | 342.47 |
| 135.0 | 473.37 | 448.43 | 420.20 | 390.52 | 360.85 | 330.76 | 302.32 | 275.94 | 252.24 |
| 157.5 | 413.58 | 366.76 | 321.79 | 286.46 | 251.76 | 211.72 | 174.75 | 144.16 | 118.49 |
| 180.0 | 415.21 | 369.08 | 320.05 | 269.15 | 218.88 | 165.92 | 114.61 | 67.86 | 27.10 |
| 202.5 | 411.10 | 369.79 | 331.53 | 297.95 | 262.13 | 223.87 | 189.88 | 156.10 | 128.01 |
| 225.0 | 462.31 | 435.41 | 407.28 | 377.92 | 349.79 | 322.48 | 294.76 | 268.26 | 242.98 |
| 247.5 | 514.18 | 492.27 | 468.70 | 444.10 | 422.80 | 397.58 | 372.97 | 347.75 | 322.53 |
| 270.0 | 527.15 | 506.66 | 485.96 | 462.94 | 439.71 | 416.90 | 392.83 | 370.44 | 345.73 |
| 292.5 | 508.10 | 487.09 | 465.26 | 441.80 | 415.90 | 388.57 | 364.91 | 339.82 | 315.34 |
| 315.0 | 456.88 | 431.74 | 407.22 | 376.30 | 346.63 | 318.39 | 289.96 | 263.37 | 239.67 |
| 337.5 | 415.01 | 371.27 | 327.54 | 286.46 | 249.71 | 216.44 | 181.33 | 150.93 | 123.01 |
| 360.0 | 400.52 | 353.56 | 305.98 | 254.88 | 204.19 | 151.23 | 100.96 | 53.58 | 18.41 |
| C/γ(°) | 90.0 | 95.0 | 100.0 | 105.0 | 110.0 | 115.0 | 120.0 | 125.0 | 130.0 |
| 0.0 | 5.17 | 5.59 | 8.28 | 11.17 | 15.10 | 19.45 | 23.59 | 27.52 | 31.24 |
| 22.5 | 117.43 | 100.74 | 89.34 | 80.19 | 74.28 | 70.82 | 69.81 | 68.18 | 67.36 |
| 45.0 | 243.39 | 220.76 | 202.01 | 183.25 | 167.97 | 148.19 | 131.27 | 120.67 | 113.34 |
| 67.5 | 333.90 | 309.50 | 285.11 | 262.78 | 240.24 | 218.95 | 184.01 | 170.36 | 156.51 |
| 90.0 | 359.03 | 335.38 | 310.88 | 288.07 | 265.05 | 242.24 | 216.90 | 194.30 | 178.67 |
| 112.5 | 323.70 | 299.64 | 273.12 | 252.11 | 230.90 | 210.91 | 176.84 | 162.77 | 150.33 |
| 135.0 | 232.87 | 211.03 | 191.86 | 175.37 | 158.48 | 143.43 | 124.68 | 115.82 | 109.02 |
| 157.5 | 101.65 | 86.86 | 76.19 | 68.59 | 64.89 | 63.04 | 63.04 | 60.99 | 64.07 |
| 180.0 | 5.38 | 4.76 | 6.00 | 8.90 | 12.83 | 16.55 | 20.69 | 24.41 | 28.34 |
| 202.5 | 106.24 | 91.38 | 79.17 | 70.21 | 63.09 | 55.76 | 52.91 | 51.69 | 55.15 |
| 225.0 | 218.72 | 200.17 | 181.83 | 161.85 | 147.58 | 130.26 | 115.17 | 103.96 | 94.58 |
| 247.5 | 296.48 | 276.84 | 255.13 | 235.49 | 211.92 | 194.76 | 170.15 | 155.48 | 139.76 |
| 270.0 | 321.65 | 299.48 | 277.30 | 256.39 | 230.42 | 214.15 | 187.12 | 170.44 | 153.33 |
| 292.5 | 290.05 | 269.45 | 249.05 | 228.86 | 205.20 | 189.08 | 161.75 | 149.10 | 135.85 |
| 315.0 | 214.74 | 195.57 | 176.20 | 160.33 | 146.11 | 132.72 | 120.15 | 102.83 | 96.65 |
| 337.5 | 98.98 | 82.35 | 71.46 | 62.84 | 57.70 | 52.57 | 55.03 | 57.50 | 55.03 |
| 360.0 | 5.17 | 5.59 | 8.28 | 11.17 | 15.10 | 19.45 | 23.59 | 27.52 | 31.24 |



| C/γ(°) | 135.0 | 140.0 | 145.0 | 150.0 | 155.0 | 160.0 | 165.0 | 170.0 | 175.0 |
|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| 0.0 | 34.34 | 37.86 | 40.34 | 42.41 | 44.07 | 48.00 | 53.79 | 64.75 | 80.89 |
| 22.5 | 70.42 | 73.88 | 76.73 | 79.78 | 82.02 | 83.65 | 81.61 | 71.43 | 77.34 |
| 45.0 | 106.41 | 101.11 | 98.05 | 95.40 | 93.16 | 91.12 | 88.88 | 79.09 | 75.63 |
| 67.5 | 141.62 | 130.67 | 119.91 | 111.85 | 105.03 | 100.07 | 95.93 | 93.04 | 67.81 |
| 90.0 | 163.89 | 150.37 | 137.07 | 124.82 | 115.74 | 106.87 | 101.59 | 96.09 | 64.84 |
| 112.5 | 137.68 | 127.28 | 120.34 | 114.22 | 107.49 | 95.26 | 79.14 | 57.93 | 68.33 |
| 135.0 | 103.87 | 99.13 | 97.27 | 93.77 | 81.81 | 71.51 | 63.68 | 64.09 | 79.75 |
| 157.5 | 67.15 | 70.23 | 74.95 | 69.82 | 62.02 | 64.07 | 62.02 | 69.20 | 83.17 |
| 180.0 | 31.86 | 35.17 | 38.07 | 40.96 | 42.83 | 46.14 | 54.20 | 62.89 | 76.75 |
| 202.5 | 58.61 | 62.48 | 65.94 | 65.13 | 60.24 | 59.43 | 58.00 | 62.89 | 73.47 |
| 225.0 | 89.49 | 86.23 | 83.78 | 84.19 | 79.91 | 70.12 | 64.41 | 59.11 | 67.47 |
| 247.5 | 127.36 | 120.33 | 112.06 | 104.82 | 99.45 | 94.28 | 83.11 | 66.16 | 49.83 |
| 270.0 | 138.97 | 128.62 | 117.64 | 109.82 | 103.06 | 98.42 | 93.77 | 90.60 | 89.34 |
| 292.5 | 123.81 | 114.43 | 106.27 | 99.74 | 94.24 | 91.18 | 87.91 | 86.08 | 84.85 |
| 315.0 | 92.12 | 89.23 | 86.76 | 85.73 | 84.70 | 83.67 | 83.05 | 82.84 | 73.98 |
| 337.5 | 59.55 | 63.25 | 66.94 | 70.23 | 73.93 | 77.21 | 79.68 | 68.79 | 71.46 |
| 360.0 | 34.34 | 37.86 | 40.34 | 42.41 | 44.07 | 48.00 | 53.79 | 64.75 | 80.89 |
| C/γ(°) | 180.0 | | | | | | | | |
| 0.0 | 88.75 | | | | | | | | |
| 22.5 | 85.88 | | | | | | | | |
| 45.0 | 82.35 | | | | | | | | |
| 67.5 | 78.77 | | | | | | | | |
| 90.0 | 24.50 | | | | | | | | |
| 112.5 | 74.86 | | | | | | | | |
| 135.0 | 84.08 | | | | | | | | |
| 157.5 | 85.84 | | | | | | | | |
| 180.0 | 88.75 | | | | | | | | |
| 202.5 | 85.88 | | | | | | | | |
| 225.0 | 82.35 | | | | | | | | |
| 247.5 | 78.77 | | | | | | | | |
| 270.0 | 24.50 | | | | | | | | |
| 292.5 | 74.86 | | | | | | | | |
| 315.0 | 84.08 | | | | | | | | |
| 337.5 | 85.84 | | | | | | | | |
| 360.0 | 88.75 | | | | | | | | |



4 Additional Test

Electrical data at 277V

| Model Number | Test Item | Test Voltage (V) | Frequency (Hz) | Test Result |
|---|--------------|------------------|----------------|-------------|
| RP-T5C-G2-50W-4FT-3L-830-[OCN, Blank]-10V | Power Factor | 277 | 60 | 0.986 |
| | THD | 277 | 60 | 5.1% |
| RP-T5C-G2-60W-4FT-3L-830-[OCN, Blank]-10V | Power Factor | 277 | 60 | 0.986 |
| | THD | 277 | 60 | 6.4% |
| RP-T5C-G2-70W-4FT-3L-830-[OCN, Blank]-10V | Power Factor | 277 | 60 | 0.983 |
| | THD | 277 | 60 | 6.9% |
| RP-T5CHO-G2-80W-4FT-3L-830-[OCN, Blank]-10V | Power Factor | 277 | 60 | 0.976 |
| | THD | 277 | 60 | 7.2% |

5 Performance Assessment

| Model name | CCT(K) | Total Luminous(lm) | Power(W) | Luminous Efficacy(lm/W) |
|---|--------|------------------------|----------------------|-------------------------|
| RP-T5C-G2-50W-4FT-3L-830-[OCN, Blank]-10V | 3000K | 2138.93 | 17.26 | 123.9 |
| RP-T5C-G2-50W-4FT-3L-835-[OCN, Blank]-10V | 3500K | 2151.24 * ¹ | 17.25 * ² | 124.7 * ³ |
| RP-T5C-G2-50W-4FT-3L-840-[OCN, Blank]-10V | 4000K | 2163.56 * ¹ | 17.25 * ² | 125.4 * ³ |
| RP-T5C-G2-50W-4FT-3L-850-[OCN, Blank]-10V | 5000K | 2188.18 | 17.24 | 126.9 |

*1: This value is calculated and the calculation formula is as below:

$$2151.24 = (2188.18 - 2138.93) / 4 + 2138.93$$

$$2163.56 = (2188.18 - 2138.93) / 4 + 2151.24$$

*2: This value is calculated and the calculation formula is as below:

$$17.25 = (17.26 + 17.24) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$124.7 = 2151.24 / 17.25$$

$$125.4 = 2163.56 / 17.25$$



| Model name | CCT(K) | Total Luminous(lm) | Power(W) | Luminous Efficacy(lm/W) |
|---|--------|-----------------------|---------------------|-------------------------|
| RP-T5C-G2-60W-4FT-3L -830-[OCN, Blank]-10V | 3000K | 2471.71 | 20.24 | 122.1 |
| RP-T5C-G2-60W-4FT-3L -835-[OCN, Blank]-10V | 3500K | 2487.05 ^{*1} | 20.22 ^{*2} | 123.0 ^{*3} |
| RP-T5C-G2-60W-4FT-3L -840-[OCN, Blank]-10V | 4000K | 2502.40 ^{*1} | 20.22 ^{*2} | 123.8 ^{*3} |
| RP-T5C-G2-60W-4FT-3L -850-[OCN, Blank]-10V | 5000K | 2533.08 | 20.20 | 125.4 |

*1: This value is calculated and the calculation formula is as below:

$$2487.05 = (2533.08 - 2471.71) / 4 + 2471.71$$

$$2502.40 = (2533.08 - 2471.71) / 4 + 2487.05$$

*2: This value is calculated and the calculation formula is as below:

$$20.22 = (20.24 + 20.20) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$123.0 = 2487.05 / 20.22$$

$$123.8 = 2502.40 / 20.22$$

| Model name | CCT(K) | Total Luminous(lm) | Power(W) | Luminous Efficacy(lm/W) |
|---|--------|-----------------------|---------------------|-------------------------|
| RP-T5C-G2-70W-4FT-3L -830-[OCN, Blank]-10V | 3000K | 2929.77 | 24.11 | 121.5 |
| RP-T5C-G2-70W-4FT-3L -835-[OCN, Blank]-10V | 3500K | 2953.77 ^{*1} | 24.21 ^{*2} | 122.0 ^{*3} |
| RP-T5C-G2-70W-4FT-3L -840-[OCN, Blank]-10V | 4000K | 2977.77 ^{*1} | 24.21 ^{*2} | 123.0 ^{*3} |
| RP-T5C-G2-70W-4FT-3L -850-[OCN, Blank]-10V | 5000K | 3025.77 | 24.30 | 124.5 |

*1: This value is calculated and the calculation formula is as below:

$$2953.77 = (3025.77 - 2929.77) / 4 + 2929.77$$

$$2977.77 = (3025.77 - 2929.77) / 4 + 2953.77$$

*2: This value is calculated and the calculation formula is as below:

$$24.21 = (24.11 + 24.30) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$122.0 = 2953.77 / 24.21$$

$$123.0 = 2977.77 / 24.21$$



| Model name | CCT(K) | Total Luminous(lm) | Power(W) | Luminous Efficacy(lm/W) |
|--|--------|------------------------|----------------------|-------------------------|
| RP-T5CHO-G2-80W-4FT -3L-830-[OCN, Blank]-10V | 3000K | 3240.37 | 26.77 | 121.0 |
| RP-T5CHO-G2-80W-4FT -3L-835-[OCN, Blank]-10V | 3500K | 3257.20 * ¹ | 26.76 * ² | 121.7 * ³ |
| RP-T5CHO-G2-80W-4FT -3L-840-[OCN, Blank]-10V | 4000K | 3274.04 * ¹ | 26.76 * ² | 122.4 * ³ |
| RP-T5CHO-G2-80W-4FT -3L-850-[OCN, Blank]-10V | 5000K | 3307.70 | 26.74 | 123.7 |

*1: This value is calculated and the calculation formula is as below:

$$3257.20 = (3307.70 - 3240.37) / 4 + 3240.37$$

$$3274.04 = (3307.70 - 3240.37) / 4 + 3257.20$$

*2: This value is calculated and the calculation formula is as below:

$$26.76 = (26.77 + 26.74) / 2$$

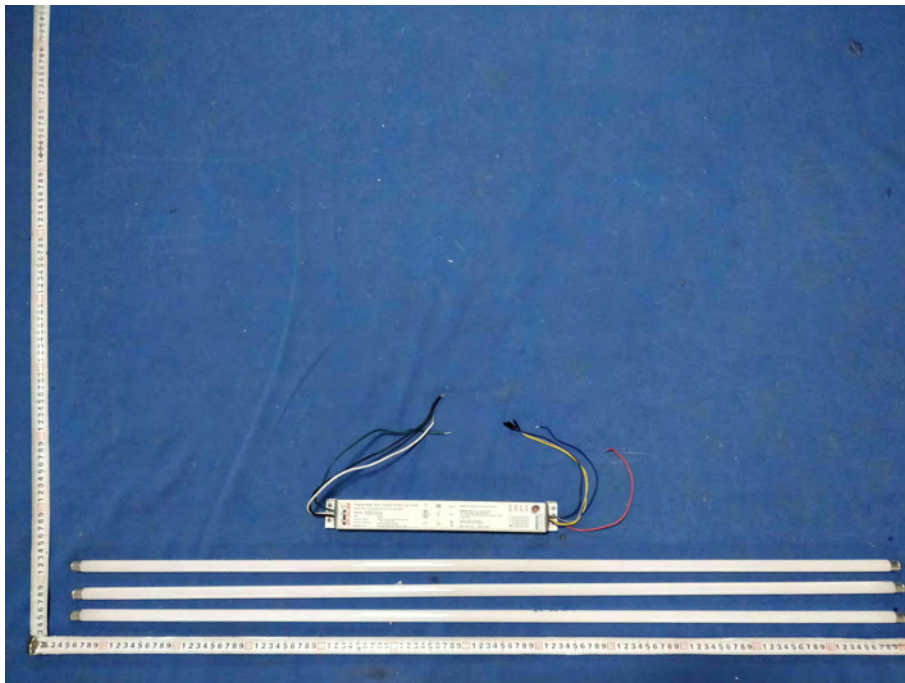
*3: This value is calculated and the calculation formula is as below:

$$121.7 = 3257.20 / 26.76$$

$$122.4 = 3274.04 / 26.76$$



Photo Document



****End of test report****