

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2017

Prepared For

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DLF2103111

Report Number

DLF2103111-2a

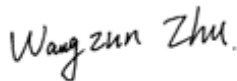
Test Date

2021/3/15

Issue Date

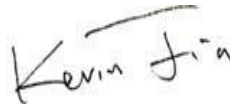
2021/4/1

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v5.0

T8 Four-Foot Linear Replacement Lamps Internal Driver/Line Voltage (UL Type B) Lamps				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm)	IES LM-79-2008	2000		2272
Luminaire Efficacy (lm/W)	IES LM-79-2008	120		160.2
Beam Angle	IES LM-79-2008	≥ 160		203.8
Total Harmonic Distortion (A%)	ANSI C82.77:2014	20%	120V	17.24%
			277V	19.79%
Power Factor	ANSI C82.77:2014	0.9	120V	0.984
			277V	0.935
Lamp light output (lm)	IES LM-79-2008 CIE 13.3-1995	1600		2270
				2283
				2342
				2404
Lamp Efficacy (lm/W)	IES LM-79-2008 CIE 13.3-1995	120		160.20
				161.57
				164.47
				168.23
Allowable CCTs* (K)	IES LM-79-2008	7 step	3045 $\pm$ 175	3029
		7 step	3465 $\pm$ 245	3483
		7 step	3985 $\pm$ 275	3949
		7 step	5029 $\pm$ 355	4862
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥ 70		83
				83
				82
				82
Minimum R9	IES LM-79-2008 CIE 13.3-1995	≥ 0		7
				7
				3
				0
Minimum Rf	ANSI/IES TM-30-18	≥ 70		85
				84
				84
				82
Minimum Rg	ANSI/IES TM-30-18	≥ 89		96
				96
				95
				95
IES Rcs,h1	ANSI/IES TM-30-18	$-12\% \leq \text{IES Rcs,h1} \leq +23\%$		-11%
				-12%
				-12%
				-14%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/3/15	L48T8/830/10G-ID DE (-aa)	B1
			L48T8/835/10G-ID DE (-aa)	B2
			L48T8/840/10G-ID DE (-aa)	B3
			L48T8/850/10G-ID DE (-aa)	B4
2	Goniophotometer Test	2021/3/15	L48T8/830/10G-ID DE (-aa)	B1
3	THD and PF Test	2021/3/15	L48T8/830/10G-ID DE (-aa)	B1

Remark(If any)

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- 2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

3.0 Production Description

Luminaire Description: L48T8/830/10G-ID DE (-aa)

Electrical Specification: 120-277V,60HZ

Fixture:

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 3000K

Model No.	L48T8/830/10G-ID DE (-aa)	Sample ID.	B1
Operate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.00	60	0.120	14.2	0.984

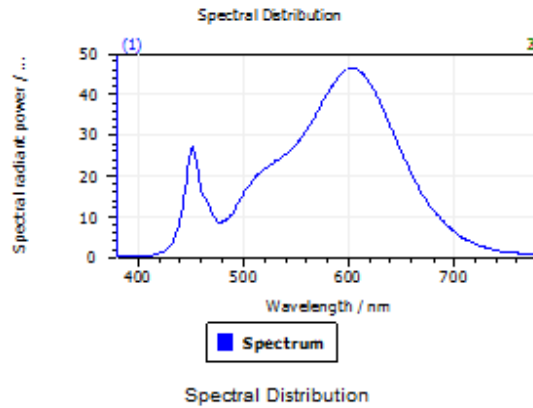
Test Result

CCT (K)	CRI	R9	Duv	THD
3029	83	7	0.000069	17.24%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
85	96	-11%	2270	160.20

4.1 Integrating Sphere Test

Results



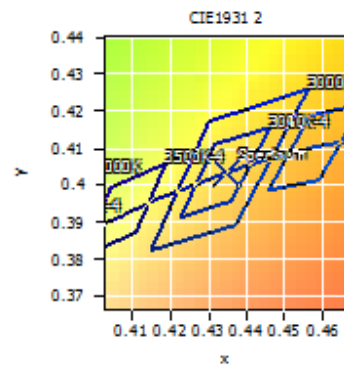
Spectral values

DominantWavelength	582.73 nm
Purity	0.515
PeakWavelength	603.22 nm
Radiant Power	6.841 W
Width50%:	
Luminous Flux	2.27 klm

Date: 2021/3/12 13:21:44

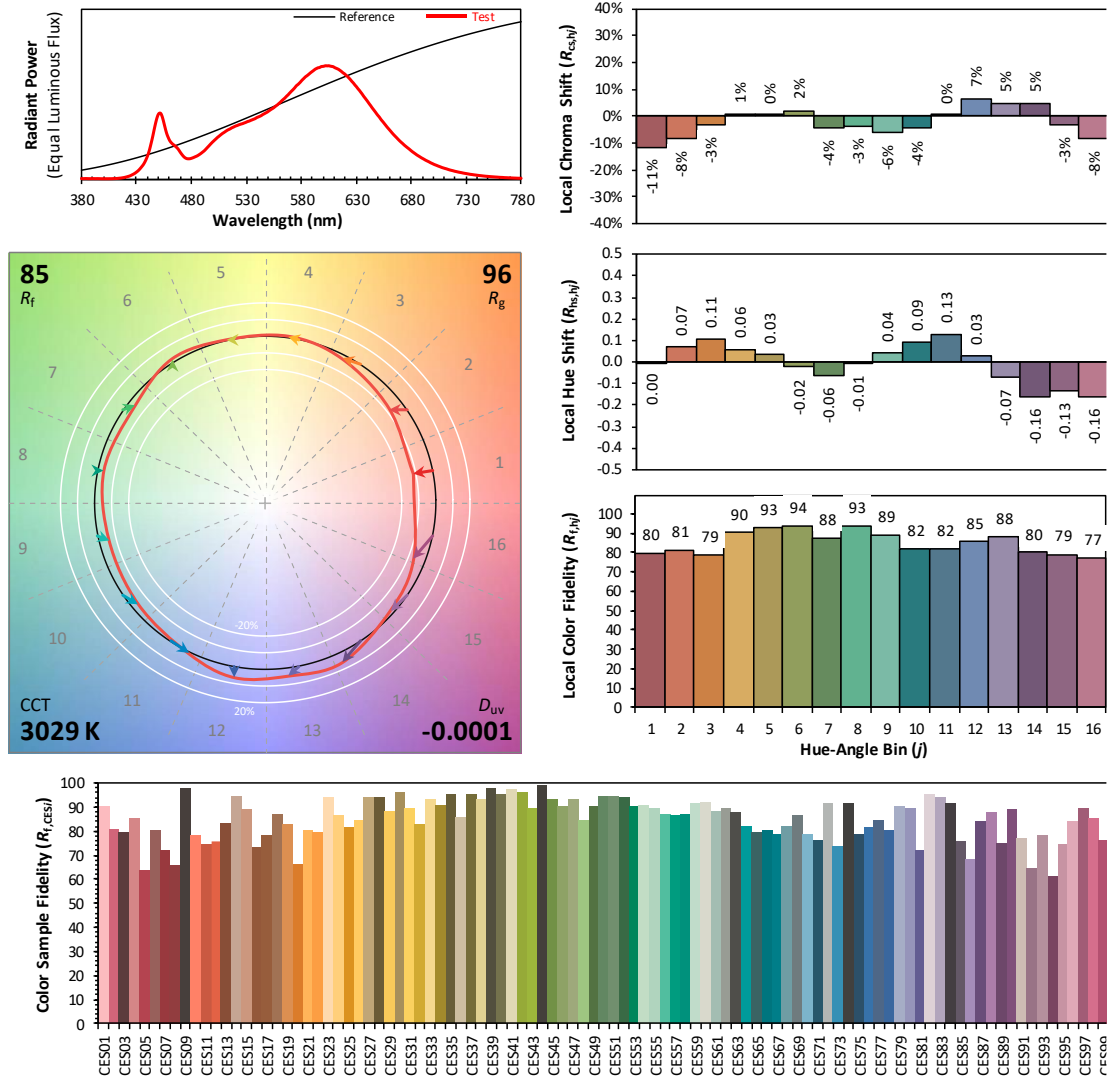
Color Coordinates

Correlated Color Temperatu		3029 K	
x: 0.4348	u: 0.2496	u': 0.2496	
y: 0.4032	v: 0.3471	v': 0.5207	
CRI01	81.8	CRI09	7.2
CRI02	91.4	CRI10	80.5
CRI03	96.5	CRI11	81.7
CRI04	81.7	CRI12	71.3
CRI05	82.1	CRI13	84.1
CRI06	89.6	CRI14	98.7
CRI07	83.2	CRI15	74.1
CRI08	59.6	CRI16	71.4
ResultsCRI	83.2		



PlanckDistance 6.9E-005

4.1 Integrating Sphere Test



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

x 0.4348
 y 0.4032
 u' 0.2496
 v' 0.5207

CIE 13.3-1995
(CRI)

R_a 83

R_g 6

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 3500K

Model No.	L48T8/835/10G-ID DE (-aa)	Sample ID.	B2
Operate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.98	60	0.120	14.1	0.984

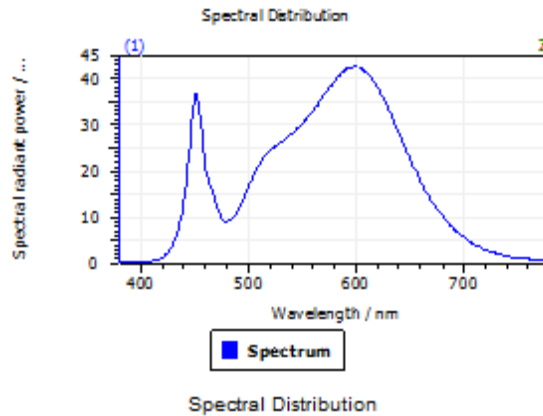
Test Result

CCT (K)	CRI	R9	Duv	THD
3483	83	7	0.00043	17.15%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
84	96	-12%	2283	161.57

4.1 Integrating Sphere Test

Results



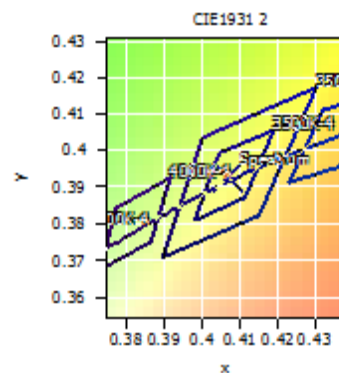
Spectral values

DominantWavelength	580.77 nm
Purity	0.399
PeakWavelength	598.38 nm
Radiant Power	6.839 W
Width50%:	
Luminous Flux	2.283 klm

Date: 2021/3/12 15:36:03

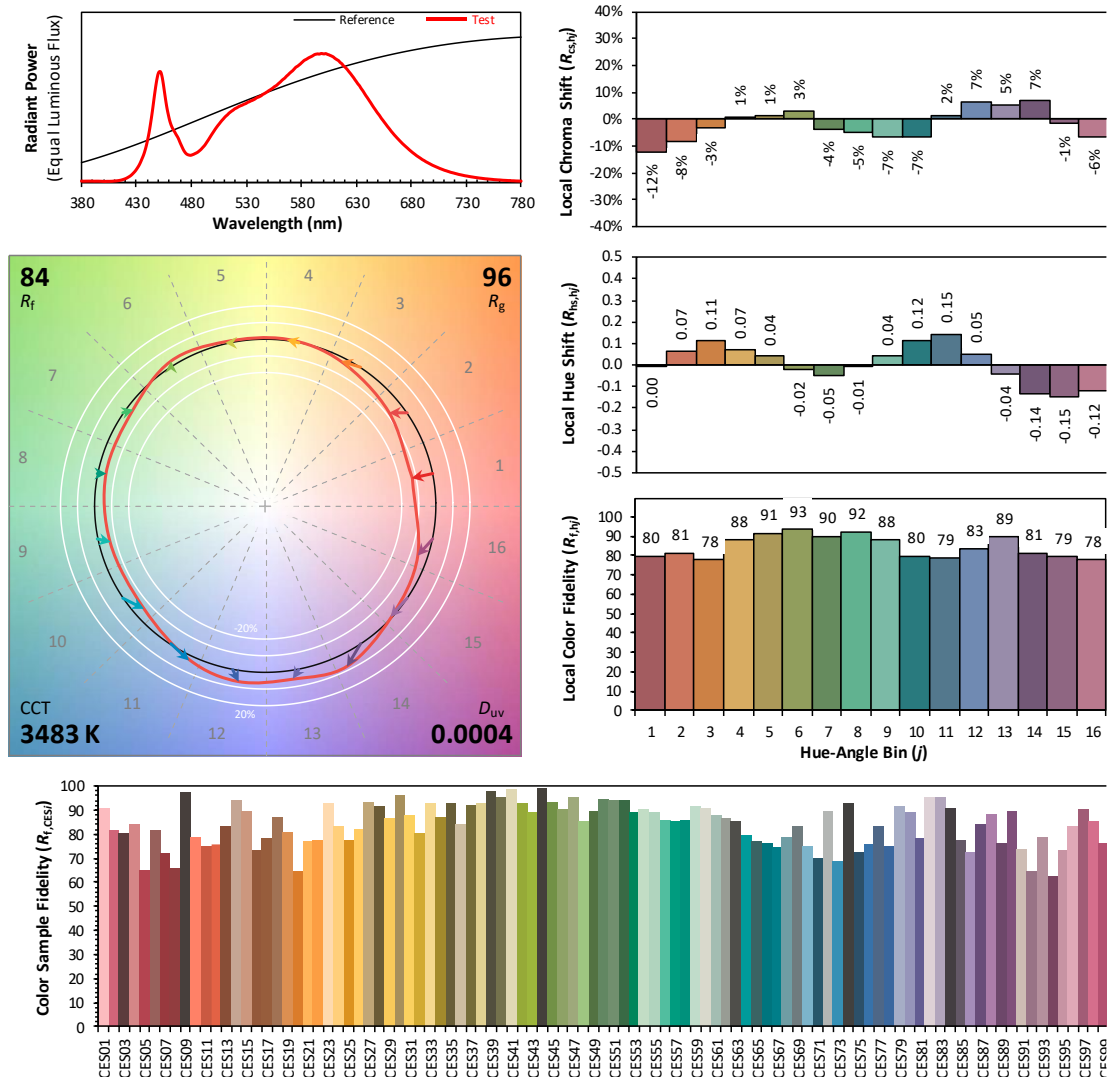
Color Coordinates

Correlated Color Temperature		3483 K
x: 0.4067	u: 0.2359	u': 0.2359
y: 0.3924	v: 0.3414	v': 0.5122
CRI01	80.9	CRI09
CRI02	89.3	CRI10
CRI03	95.7	CRI11
CRI04	81.6	CRI12
CRI05	81.0	CRI13
CRI06	85.8	CRI14
CRI07	85.1	CRI15
CRI08	62.1	CRI16
ResultsCRI	82.7	



PlankDistance 4.3E-004

4.1 Integrating Sphere Test



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

x	0.4067
y	0.3924
u'	0.2359
v'	0.5122

CIE 13.3-1995
(CRI)

R_a	83
R_9	6

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 4000K

Model No.	L48T8/840/10G-ID DE (-aa)	Sample ID.	B3
Operate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.00	60	0.119	14.2	0.994

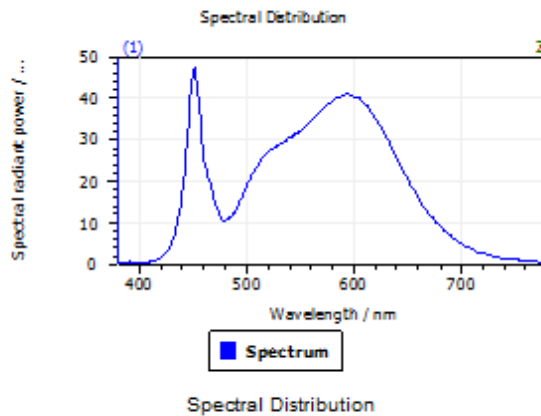
Test Result

CCT (K)	CRI	R9	Duv	THD
3949	82	3	0.00084	17.29%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
84	95	-12%	2342	164.47

4.1 Integrating Sphere Test

Results



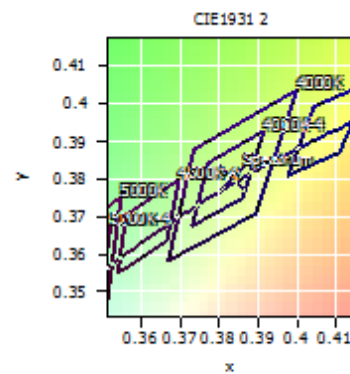
Spectral values

DominantWavelength	578.83 nm
Purity	0.292
PeakWavelength	450.91 nm
Radiant Power	7.047 W
Width50%:	
Luminous Flux	2.342 klm

Date: 2021/3/12 13:55:35

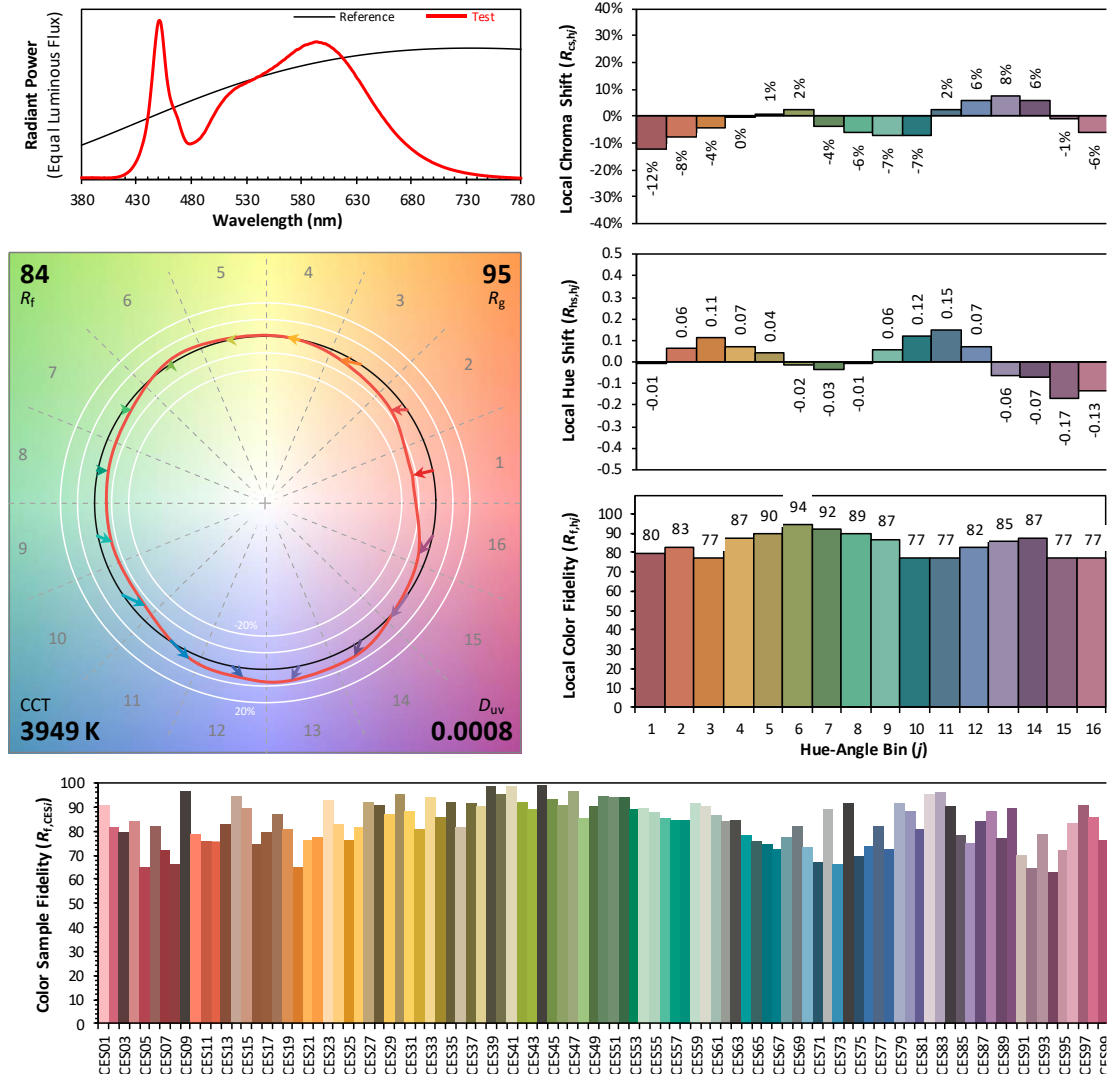
Color Coordinates

Correlated Color Temperatu		3949 K
x: 0.3834	u: 0.2256	u': 0.2256
y: 0.3803	v: 0.3357	v': 0.5036
CRI01	80.0	CRI09
CRI02	88.7	CRI10
CRI03	94.8	CRI11
CRI04	80.7	CRI12
CRI05	80.4	CRI13
CRI06	85.0	CRI14
CRI07	84.9	CRI15
CRI08	62.0	CRI16
ResultsCRI	82.1	



PlanckDistance 8.4E-004

4.1 Integrating Sphere Test



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

x 0.3833
 y 0.3803
 u' 0.2256
 v' 0.5036

CIE 13.3-1995
 (CRI)

R_a 82

R_g 6

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test - 5000K

Model No.	L48T8/850/10G-ID DE (-aa)	Sample ID.	B4
Operate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.99	60	0.121	14.3	0.984

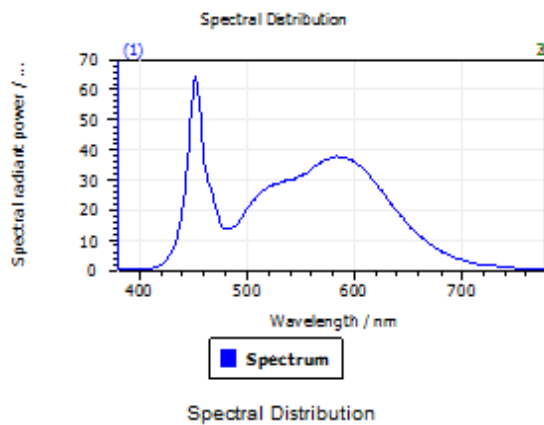
Test Result

CCT (K)	CRI	R9	Duv	THD
4862	82	0	0.00073	17.33%

Rf	Rg	IES Rcs,h1	Lamp Light Output (lm)	Lamp Efficacy (lm/W)
82	95	-14%	2404	168.23

4.1 Integrating Sphere Test

Results



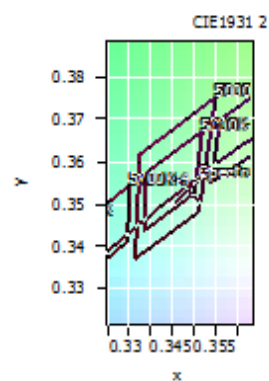
Spectral values

DominantWavelength 575.13 nm
Purity 0.107
PeakWavelength 451.82 nm
Radiant Power 6.896 W
Width50%:

Color Coordinates

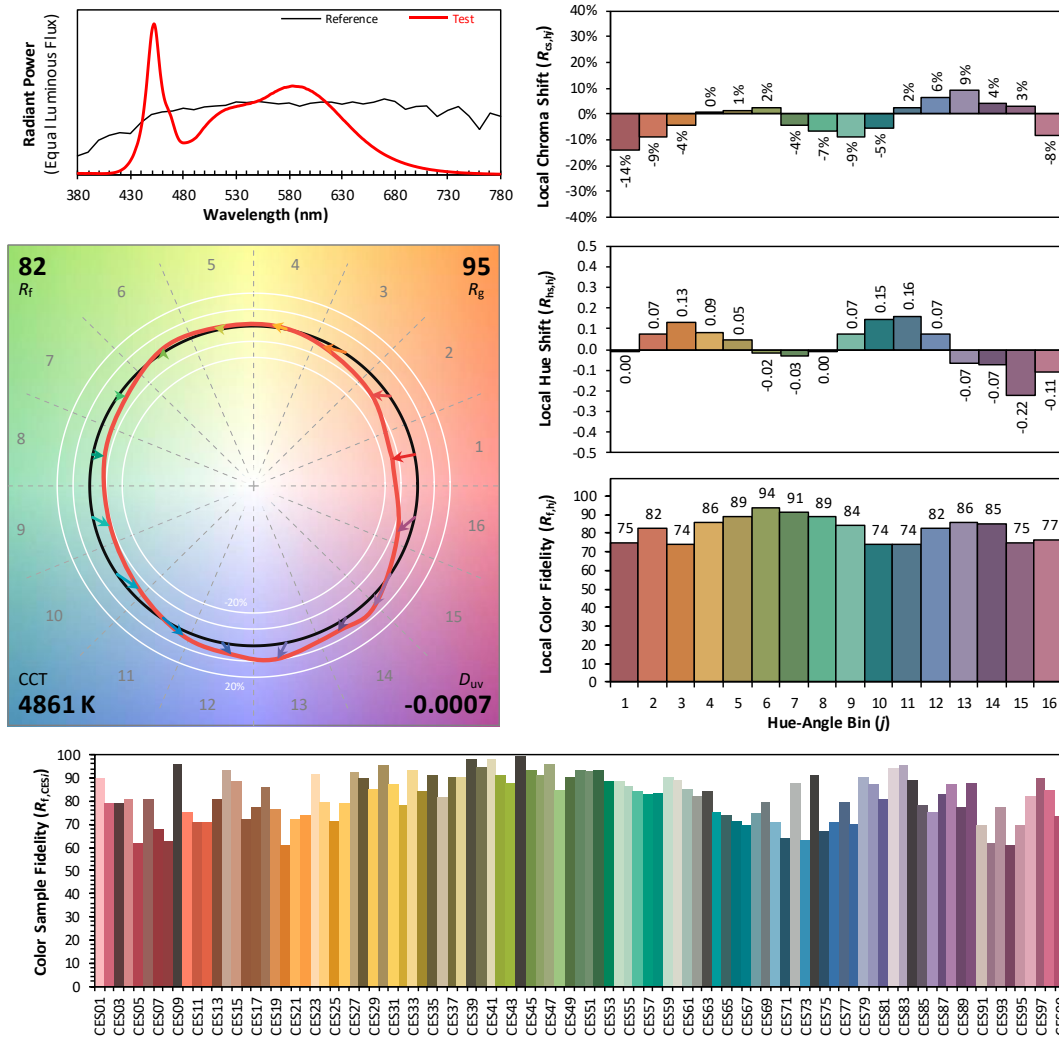
Correlated Color Temperatu 4862 K
x: 0.3489 u: 0.2134 u': 0.2134
y: 0.3532 v: 0.3240 v': 0.4860

CRI01	80.0	CRI09	0.0
CRI02	88.8	CRI10	72.9
CRI03	93.7	CRI11	79.6
CRI04	80.5	CRI12	55.7
CRI05	80.6	CRI13	82.6
CRI06	83.4	CRI14	97.0
CRI07	85.5	CRI15	74.1
CRI08	63.7	CRI16	70.6
ResultsCRI	82.0		



PlanckDistance 7.3E-004

4.1 Integrating Sphere Test



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

x 0.3489
 y 0.3532
 u' 0.2134
 v' 0.4860

CIE 13.3-1995
(CRI)

R_a 83
 R_g 5

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test - 3000K

Model No.	L48T8/830/10G-ID DE (-aa)	Sample ID.	B1
Operate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

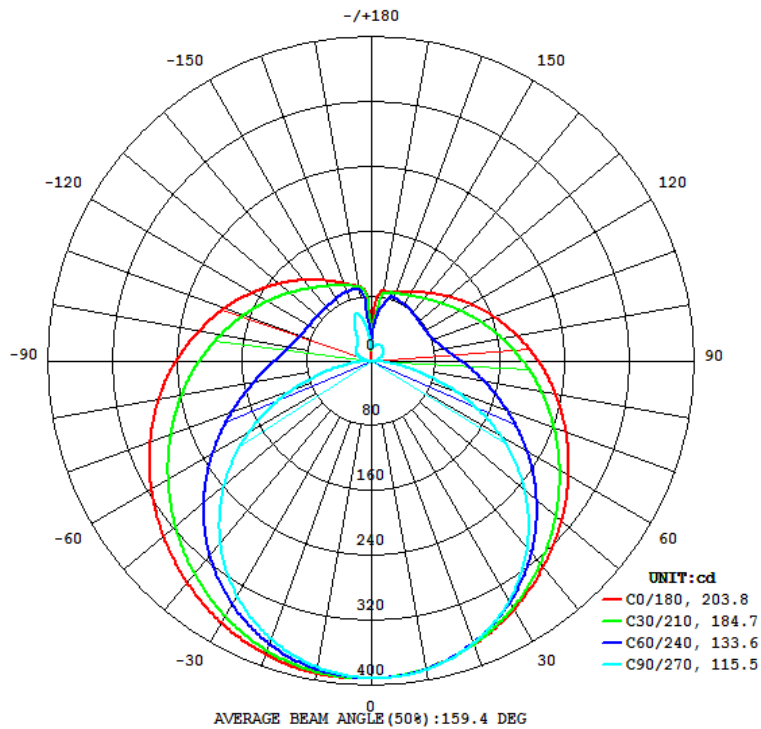
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	120.06	60	0.120	14.2	0.982

Test Result

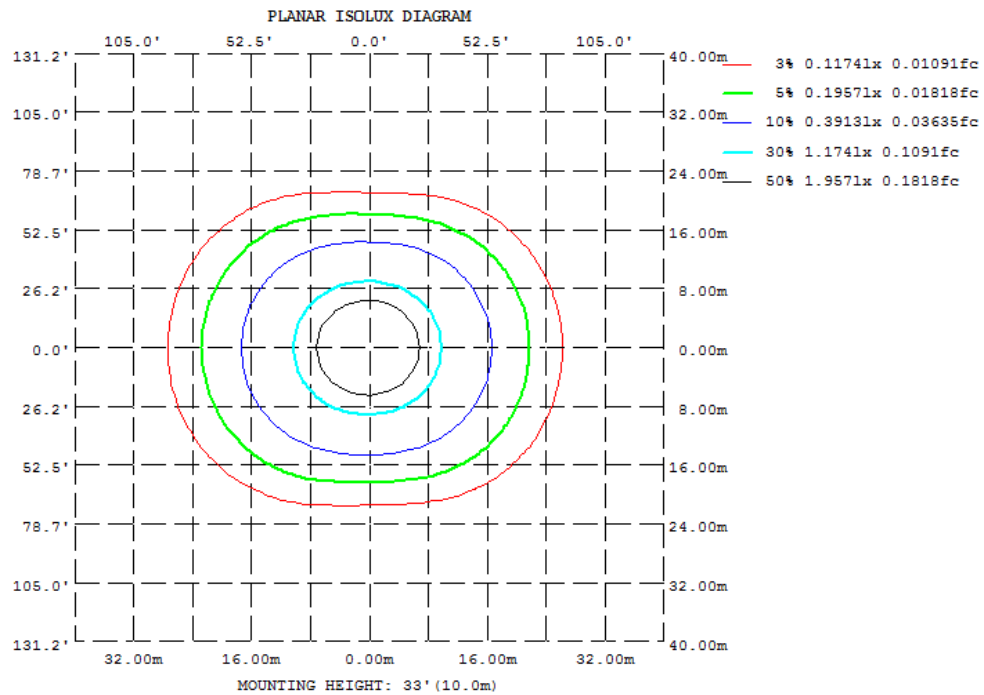
Flux (lm)	Luminous Efficacy (lm/W)	Beam Angle
2272	160.2	203.8

4.2 Goniophotometer Test

Zonal Lumen Summary



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	384.9	385.2	386.4	389.6	391.4	387.9	383.5	383.1
20	371.8	370.3	369.9	379.3	384.9	375.5	364.5	366.2
30	353.4	347.2	341.3	360.1	372.5	354.7	333.6	341.5
40	331.3	317.8	300.8	334.3	355.5	327.4	291.1	310.9
50	307.4	284.9	248.8	303.5	336.0	296.0	238.2	277.0
60	282.3	250.4	185.8	270.5	314.4	262.9	176.0	242.1
70	256.7	216.7	114.3	238.0	291.4	231.0	107.3	208.8
80	231.7	186.0	42.82	208.0	267.3	202.0	39.95	178.8
90	207.2	159.3	0.2866	181.8	242.5	176.9	0.2694	153.0
100	184.1	137.0	1.418	159.6	217.8	155.5	1.885	131.7
110	162.4	119.3	9.588	141.1	193.8	138.0	15.63	115.0
120	142.5	106.2	17.05	126.1	171.0	123.5	22.09	102.7
130	125.1	97.26	20.73	114.7	150.0	112.8	25.79	94.50
140	110.7	91.79	23.09	106.1	131.3	104.8	27.05	89.69
150	99.39	88.74	24.24	99.73	115.5	99.54	36.23	86.75
160	91.83	85.35	21.67	95.03	102.9	96.40	61.30	81.68
170	88.32	70.58	19.01	91.56	94.01	92.47	47.65	60.45
180	8.393	19.56	24.83	21.06	0.3460	18.58	24.52	22.36
DEG	LUMINOUS INTENSITY:cd							

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	L48T8/830/10G-ID DE (-aa)	Sample ID.	B1
Temperature (°C)	25.1	Humidity (%RH)	52.0

Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.00	60	0.122	14.4	0.984	17.24%
277.02	60	0.055	14.2	0.935	19.79%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

***** End of Test Report*****