



# Photometric Test Report

## Relevant Standards

- IES LM-79-2008
- ANSI C82.77:2014

## Prepared For RAB LIGHTING INC

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**DLF1904108**

## Report Number

**DLF1904108-8a**

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**2019/4/11**

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**2019/4/12**

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## 1.0 Test Summary

DLC Technical Requirements v4.4

<b>Linear Replacement Lamps - Replacement Lamps ("Plug and Play") (UL Type A)</b>				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
<b>Bare Lamp</b>				
Lamp Output for bare lamp (lm)	IES LM-79-2008	$\geq 1600$	2052	P
		$\geq 1600$	2174	P
Minimum Lamp Efficacy (lm/W)	IES LM-79-2008	$\geq 110$	131.3	P
		$\geq 110$	136.8	P
Allowable CCTs* (K)	IES LM-79-2008	3045 $\pm$ 175	3032	P
		5029 $\pm$ 283	4954	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	$\geq 80$	83.7	P
		$\geq 80$	85.4	P
Power Factor	ANSI C82.77:2014	$\geq 0.9$	0.993	P
		$\geq 0.9$	0.958	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	$\leq 25\%$	5.98%	P
		$\leq 25\%$	12.37%	P
<b>in Fixture</b>				
Lamp Output (lm)	IES LM-79-2008	$\geq 2700$	3204	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	$\geq 100$	105.0	P
Zonal Lumen Requirement(0°-60°)	IES LM-79-2008	$\geq 75\%$	78.30%	P
SC (0°-180°)	IES LM-79-2008	1.0-2.0	1.21	P
SC (90°-270°)	IES LM-79-2008	1.0-2.0	1.15	P

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/4/11	T8-14-48GC-830-DIR/T8-14-48GC-850-DIR	H1/H3
2	Goniophotometer Test	2019/4/11	T8-14-48GC-830-DIR	H1-H2
3	THD and PF Test	2019/4/11	T8-14-48GC-830-DIR	H1

### 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:** T8-14-48GC-830-DIR / T8-14-48GC-850-DIR

**Electrical Specification:** 120V-277V,60HZ,14W

**Test in fixture:** Lithonia 2GT8 lensed 2x4

#### Photos of Luminaire Characteristics



## 4.0 LM-79 Measurement and Test Results

### 4.1 Integrating Sphere Test

Model No.	T8-14-48GC-830-DIR	Sample ID.	H1
Model No.	T8-14-48GC-850-DIR	Sample ID.	H3
Operate time (Min.)	90	Stabilization time (Min.)	45

#### 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  $\pm 0.2$  percent under load.

The sample was measured using  $4\pi$  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 Conditions

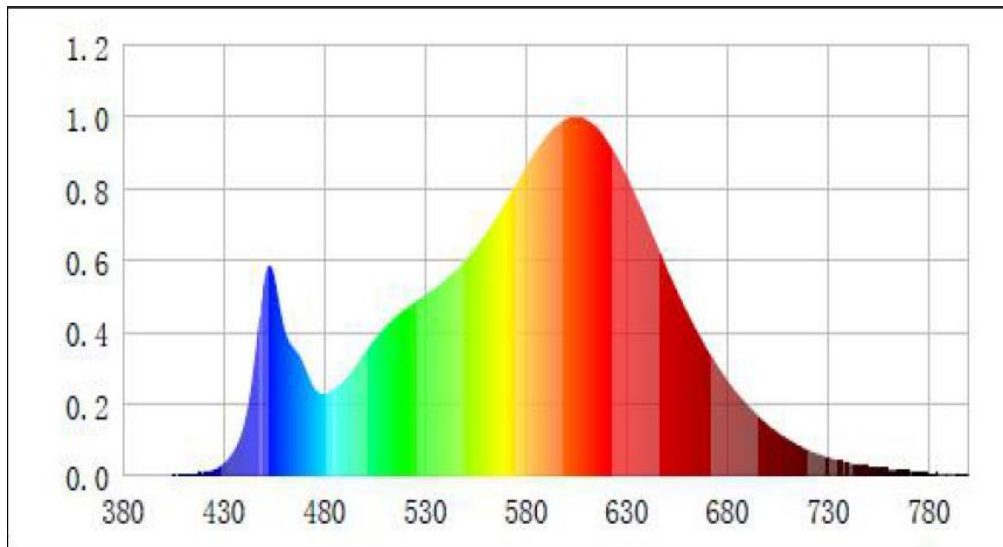
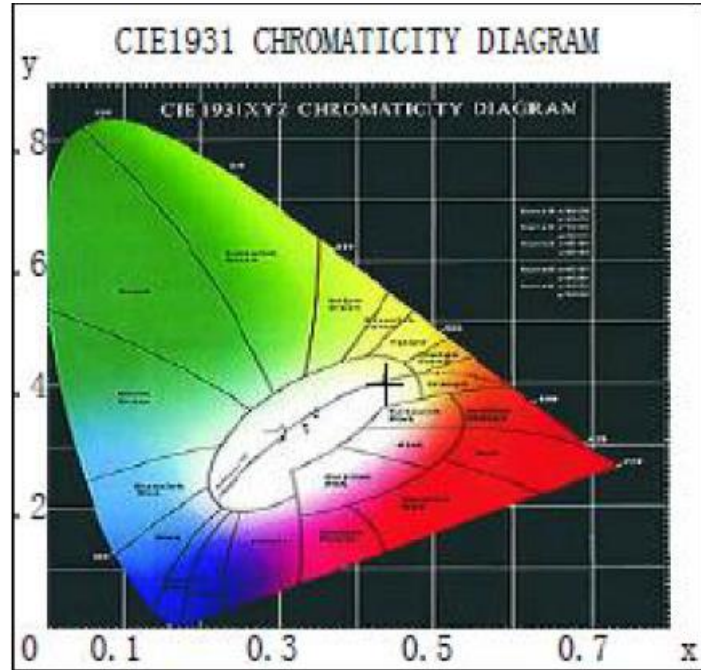
Model No.	Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
T8-14-48GC-830-DIR	25.1	120.00	60	0.131	15.63	0.993
T8-14-48GC-850-DIR	25.1	120.00	60	0.133	15.89	0.993

#### Test Result

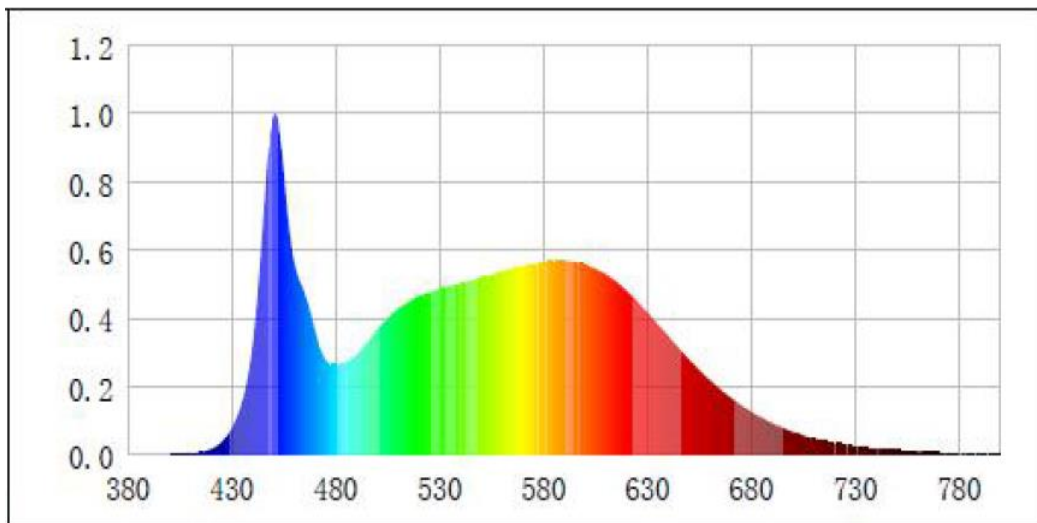
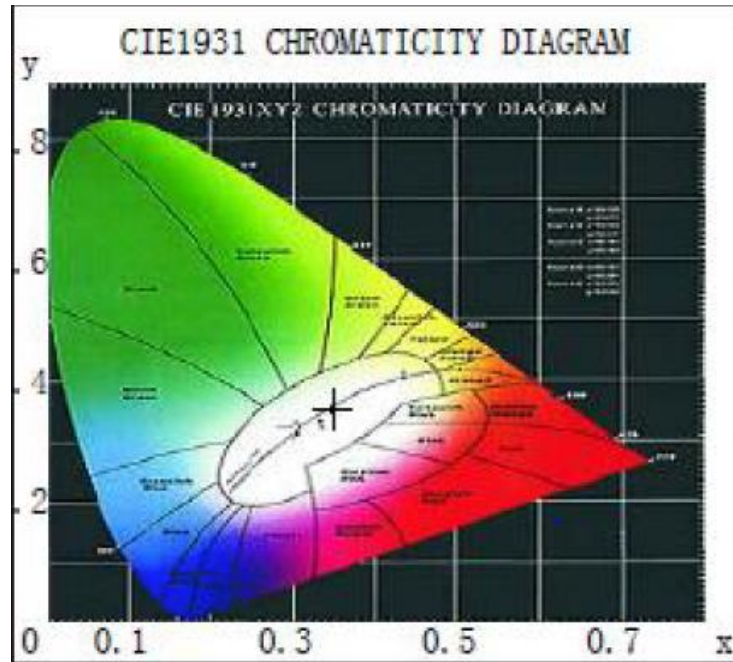
Model No.	CCT (K)	CRI (Ra)	Light Output (lm)	Efficacy (lm/W)	Duv
T8-14-48GC-830-DIR	3032	83.7	2052	131.3	-6.0E-05
T8-14-48GC-850-DIR	4954	85.4	2174	136.8	1.5E-03

### 4.1 Integrating Sphere Test

T8-14-48GC-830-DIR



### 4.1 Integrating Sphere Test T8-14-48GC-850-DIR



## 4.0 LM-79 Measurement and Test Results

### 4.3 Goniophotometer Test

Model No.	T8-14-48GC-830-DIR	Sample ID.	H1-H2
Operate time (Min.)	90	Stabilization time (Min.)	45

#### 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  $\pm 0.2$  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  $0.5^{\circ}$  vertical intervals and  $10^{\circ}$  horizontal intervals.

#### Test Conditions

Two tubes were placed in a reference housing during testing

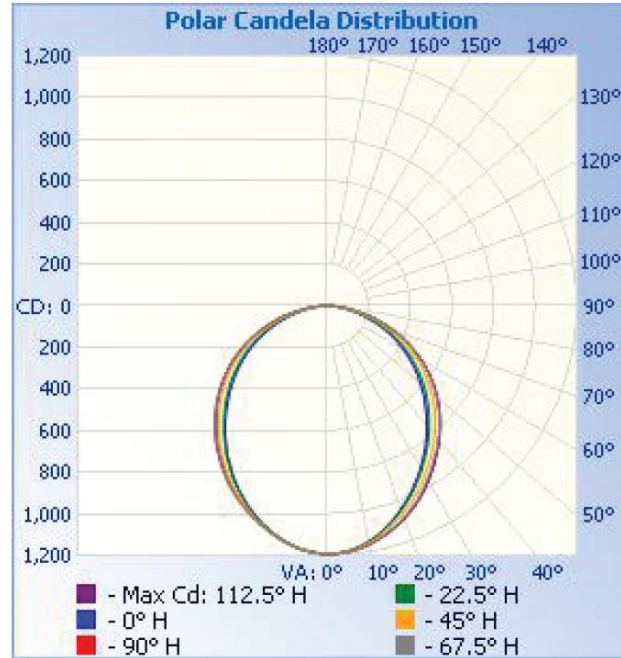
Temperature ( $^{\circ}\text{C}$ )	Voltage (Vac)	Frequency (Hz)	Power (W)	Orientation
25.10	120.00	60	30.51	Light Down

#### Test Result

Flux(lm)	Zonal Lumen Requirement( $0^{\circ}$ - $60^{\circ}$ )	SC ( $0^{\circ}$ - $180^{\circ}$ )	SC ( $90^{\circ}$ - $270^{\circ}$ )	Luminous Efficacy (lm/W)
3204	78.30%	1.21	1.15	105.0

### 4.3 Goniophotometer Test

#### Light Distribution Curve



### 4.3 Goniophotometer Test

#### Zonal Lumen Summary

Zonal Lumen Summary				Lumens Per Zone					
Zone	Lumens	% Lamp	% Luminaire	Zone	Lumens	% Total	Zone	Lumens	% Total
0-30	889.6	27.8%	27.8%	0-10	112.0	3.5%	90-100	2.8	0.1%
0-40	1,435.8	44.8%	44.8%	10-20	314.0	9.8%	100-110	2.4	0.1%
0-60	2,508.2	78.3%	78.3%	20-30	463.6	14.5%	110-120	2.3	0.1%
60-90	679.9	21.2%	21.2%	30-40	546.2	17.0%	120-130	2.3	0.1%
70-100	290.2	9.1%	9.1%	40-50	561.9	17.5%	130-140	2.1	0.1%
90-120	7.5	0.2%	0.2%	50-60	510.5	15.9%	140-150	1.7	0.1%
0-90	3,188.1	99.5%	99.5%	60-70	392.6	12.3%	150-160	1.3	0%
90-180	15.9	0.5%	0.5%	70-80	224.9	7.0%	160-170	0.8	0%
0-180	3,204.0	100%	100%	80-90	62.4	1.9%	170-180	0.3	0%

## 5.0 THD and PF Test

Model No.	T8-14-48GC-830-DIR	Sample ID.	H1
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### 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

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Power Factor	THD
25.1	120.00	60	0.993	5.98%
25.1	277.00	60	0.958	12.37%

## 6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2018/12/26	2019/12/25
DLF108	Auxiliary Lamp	2018/12/26	2019/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF116	AC Power Source	2018/12/26	2019/12/25
DLF113	Power Meter	2018/12/26	2019/12/25
DLF112	Temperature Recorder	2018/12/26	2019/12/25
DLF114	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF101	Goniophotometer	2018/12/26	2019/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF104	AC Power Source	2018/12/26	2019/12/25
DLF507	DC Power Source	2018/12/26	2019/12/25
DLF102	Power Meter	2018/12/26	2019/12/25
DLF111	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF119	Power Meter	2018/12/26	2019/12/25
DLF031	Temperature data logger	2018/12/26	2019/12/25
DLF022	Digital power meter	2018/12/26	2019/12/25
DLF003	Temperature & Humidity Datalogger	2018/12/26	2019/12/25

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