Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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1.0 Test Summary

DLC Technical Requirements v4.4

Linear Replacement Lamps - Replacement Lamps ("Plug and Play") (UL Type A)				
Requirement Category	**Test Method**	**Requirements**	**Test value**	**Results (Fail/Pass)**
Bare Lamp				
Lamp Output for bare lamp (lm)	IES LM-79-2008	≥1200	1182	P
		≥1200	1222	P
Minimum Lamp Efficacy (lm/W)	IES LM-79-2008	≥110	129.0	P
		≥110	133.3	P
Alowable CCTs* (K)	IES LM-79-2008	3045±175	3080	P
		5029±283	5007	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥80	82.5	P
		≥80	82.6	P
Power Factor	ANSI C82.77:2014	≥0.9	0.987	P
		≥0.9	0.918	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	≤20%	13.71%	P
		≤20%	12.38%	P
in Fixture				
Lamp Output (lm)	IES LM-79-2008	≥2200	2227	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥100	121.0	P
Zonal Lumen Requirement(0°-60°)	IES LM-79-2008	≥40%	56.20%	P
SC (0°-180°)	IES LM-79-2008	1.0-2.0	1.26	P
SC (90°-270°)	IES LM-79-2008	1.0-2.0	1.41	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/3/26	T8-8-36G-830-DIR/ T8-8-36G-850-DIR	B1/B3
2	Goniophotometer Test	2019/3/26	T8-8-36G-830-DIR	B1-B2
3	THD and PF Test	2019/3/26	T8-8-36G-830-DIR	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.

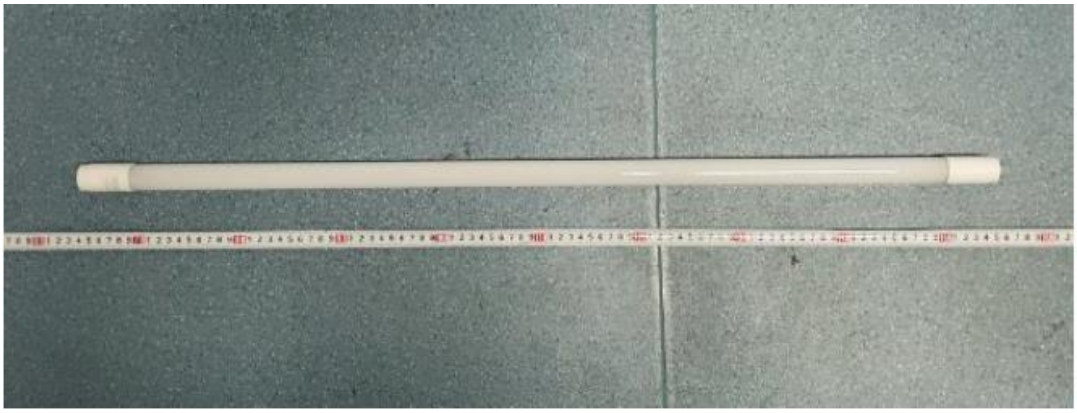
3.0 Production Description

Luminaire Description: T8-8-36G-830-DIR/ T8-8-36G-850-DIR

Electrical Specification: 120V-277V,50/60HZ, 9W

Test in fixture: Columbia CS3-225-EU

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T8-8-36G-830-DIR	Sample ID.	B1
Model No.	T8-8-36G-850-DIR	Sample ID.	B3
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 Conditions

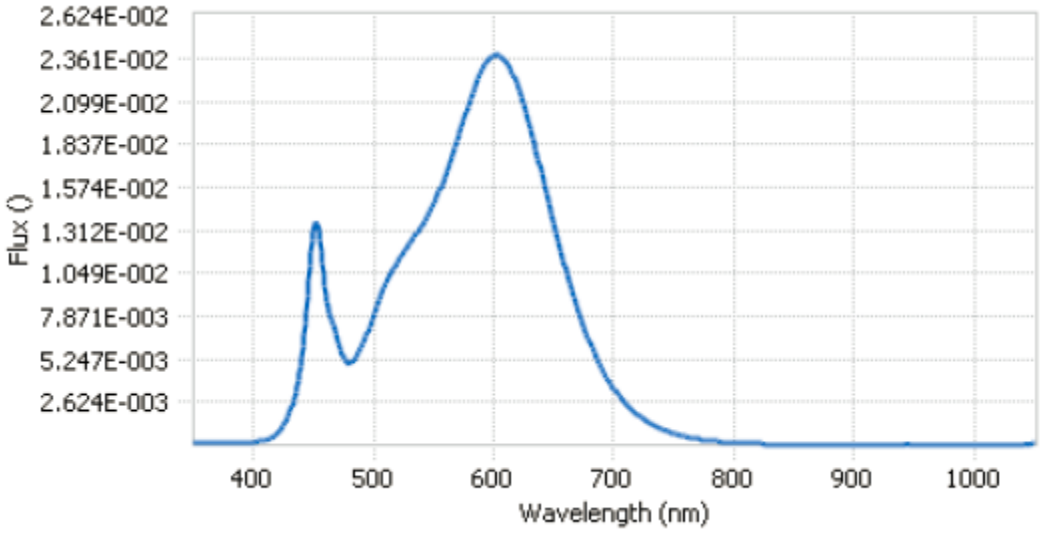
Model No.	Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
T8-8-36G-830-DIR	25.1	120.00	60	0.077	9.16	0.987
T8-8-36G-850-DIR	25.1	120.00	60	0.077	9.17	0.988

Test Result

Model No.	CCT (K)	CRI (Ra)	Light Output (lm)	Efficacy (lm/W)	Duv
T8-8-36G-830-DIR	3080	82.5	1182	129.0	9.0E-04
T8-8-36G-850-DIR	5007	82.6	1222	133.3	1.1E-03

4.1 Integrating Sphere Test

T8-8-36G-830-DIR



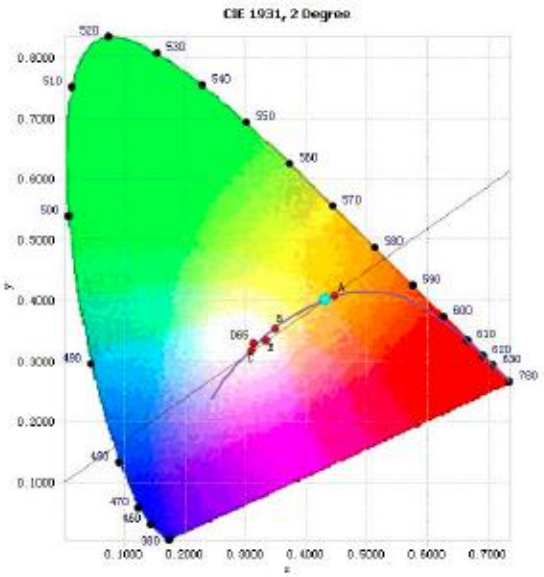


Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

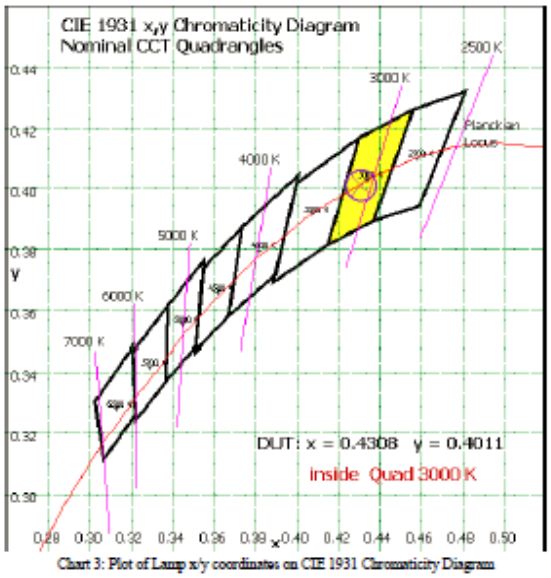


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

4.1 Integrating Sphere Test

T8-8-36G-850-DIR

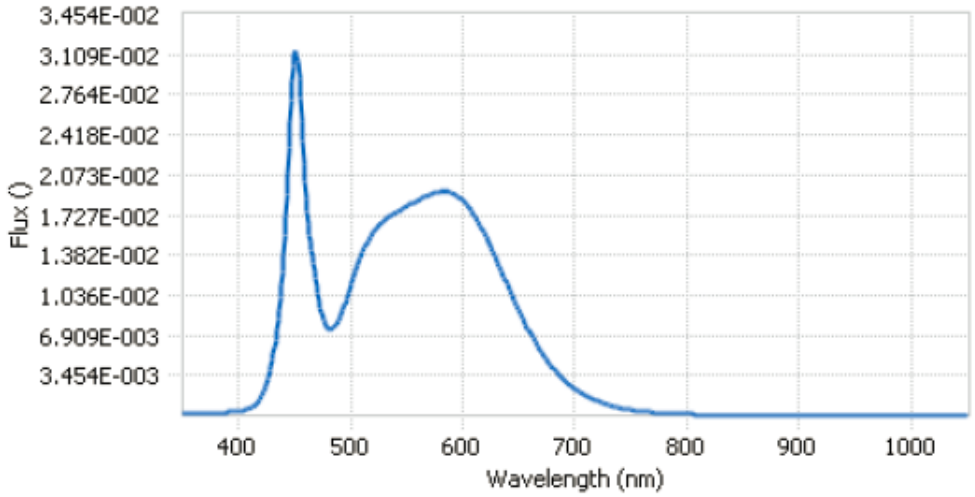


Chart 1: Spectral Power Distribution

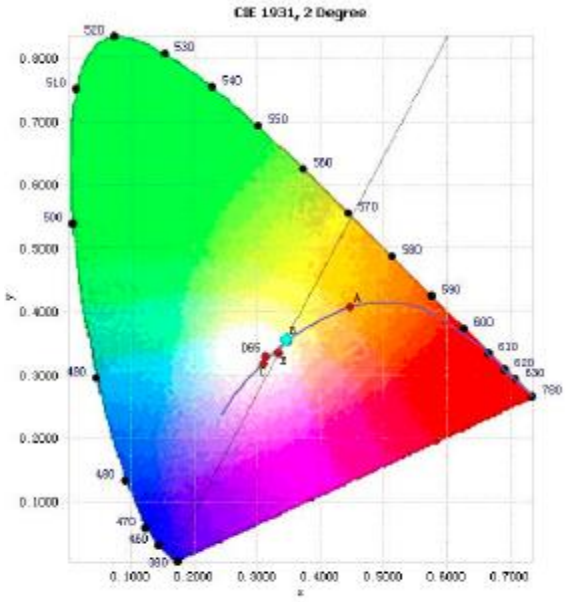


Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

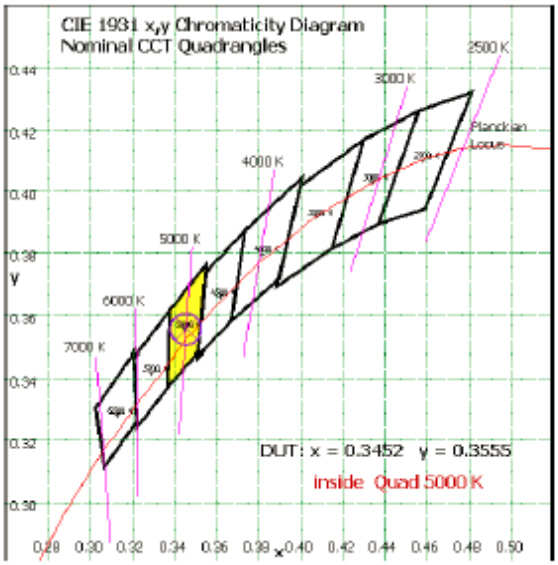


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	T8-8-36G-830-DIR	Sample ID.	B1-B2
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° 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^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Two tubes were placed in a reference housing during testing

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Power (W)	Orientation
25.10	120.00	60	18.40	Light Down

Test Result

Flux(lm)	Zonal Lumen Requirement(0°-60°)	SC (0°-180°)	SC (90°-270°)	Luminous Efficacy (lm/W)
2227	56.20%	1.26	1.41	121.0

4.3 Goniophotometer Test

Light Distrubtion Curve

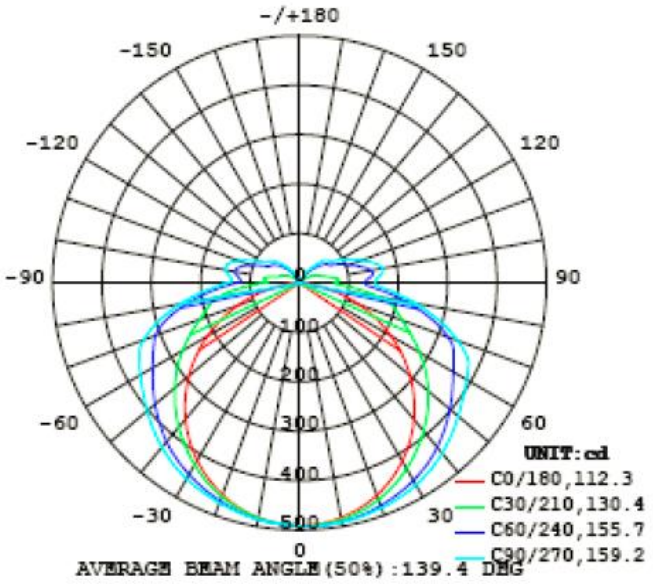


Chart 3: Polar Candela Distribution

4.3 Goniophotometer Test

Zonal Lumen Summary

γ(°)	T8-8-36G-830-DIR 2 tubes In Columbia CS3-225-EU	
	Lumens	% Total
0- 10	46.613	2.09%
10- 20	135.195	6.07%
20- 30	210.41	9.45%
30- 40	265.488	11.92%
40- 50	295.178	13.25%
50- 60	298.808	13.42%
60- 70	281.269	12.63%
70- 80	232.357	10.43%
80- 90	143.959	6.46%
90-100	102.854	4.62%
100-110	89.198	4.00%
110-120	58.106	2.61%
120-130	36.842	1.65%
130-140	21.121	0.95%
140-150	8.31	0.37%
150-160	1.271	0.06%
160-170	0.183	0.01%
170-180	0.061	0.00%
Total	2227.2	100%

5.0 THD and PF Test

Model No.	T8-8-36G-830-DIR	Sample ID.	B1

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 25º C ± 1º 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	0.987	13.71%
25.1	277.00	60	0.918	12.38%

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**********