

Test report of

## IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Imminent Teknologies Limited

Suite 5, Valley Towers, Valley Road, Birkirkara BKR9022, Malta

For products:

LED Ceiling Light

Models No.:

BLU-PHOB-30F-18W-827-W-IP65

**Test Date:** Apr. 7, 2023

**Test Lab.:** **LCTECH Guangdong Testing Services Co., Ltd.**

2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China

Tel: +86-760-22833366 E-mail: [Service@lccert.com](mailto:Service@lccert.com) <http://www.lccert.com>

1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road,

**Test Sites:** Xiaolan, Zhongshan, Guangdong, China

**Template No.:** LC-RT-PL-001 Rev.2.0

**Test Note:** N/A

**Complied by:**

Kargel Yuan

Apr. 13, 2023

**Reviewed by:**

Lin Qiu

Apr. 13, 2023

The duplication of this report or parts of it and its use for advertising purposes is only allowed with permission of the testing laboratory. This report contains the result of the examination of the product sample submitted by the applicant. A general statement concerning the quality of the products from the series manufacture cannot be derived therefore. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the US Government.

## Table of Contents

<b>1. General</b>	3
1.1 Product Information	3
1.2 Standards or methods	4
1.3 Equipment list	4
<b>2. Test conducted and method</b>	5
2.1 Ambient Condition	5
2.2 Power Supply Characteristics	5
2.3 Seasoning and Stabilization	5
2.4 Electrical Instrumentation	5
2.5 Color Measurement Method	5
2.6 Total Luminous Flux Measurement Method	5
2.7 Luminous Intensity Distribution Measurement Method	5
2.8 Spatial Non-uniformity of Chromaticity	5
<b>3. Test Result Summary</b>	6
3.1 Electrical data	6
3.2 Photometric data	6
3.3 Color Rendering Details	6
<b>4. Test Data</b>	7
4.1 Spectral Distribution	7
4.2 ANSI Chromaticity Quadrangles Diagram	7
4.3 Goniometry Test Data	8
4.4 Zonal Lumen Summary	8
4.5 Polar Curves	9
4.6 Candela Tabulation	10
<b>Appendix A Product Photo</b>	11

## 1. General

### 1.1 Product Information

Brand Name	BLUi Lighting
Product Type	LED Ceiling Light
Model Number	BLU-PHOB-30F-18W-827-W-IP65
Rated Inputs	220-240VAC, 50/60Hz
Rated Power	18W
Rated Light output	1440lm
Declared CCT	2700K
Power Supply	Integral Driver
LED Package, Array or Module	SAMSUNG
Receipt Samples	1 unit
Sample Code of lab.	230331104546
Date of Receipt Samples	Apr. 6, 2023
Note	-

## 1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
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

## 1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-987	APW-120N	2022-12-13	2023-12-12
AC Power supply	LC-I-989	APW-120N	2022-12-13	2023-12-12
Power analyzer	LC-I-PL-024	WT310E	2023-03-07	2024-03-06
Power analyzer	LC-I-954	WT210	2022-12-13	2023-12-12
Multimeter	LC-I-972	Fluke	2022-07-01	2023-06-30
Photometric colorimetric electric system <sup>1</sup>	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp <sup>2</sup>	LC-I-963	24V50W	2022-07-12	2023-07-11
Luminous flux lamp <sup>3</sup>	LC-I-PL-031	AC220V/200W	2022-07-21	2023-07-20
Goniophotometer(with mirror)	LC-I-902	GMS2000	2022-04-21	2023-04-20
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2022-12-15	2023-12-14
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2022-12-15	2023-12-14

Note:

1, Bandwidth of spectroradiometer is 1 nm.

2, Halogen lamp, 50W, omni-directional type, and its traceability to NIM.

3, Incandescent lamp, 200W, omni-directional type, and its traceability to NIM.

## 2. Test conducted and method

The luminaire was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

### 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  $\pm 0.2$  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 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 (95 % confidence interval,  $k=2$ ).

### 2.5 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.

### 2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by type C goniophotometer system.

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.

### 2.7 Luminous Intensity Distribution Measurement Method

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

### 2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

### 3. Test Result Summary

#### 3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	230.02 V~50Hz	229.99 V~50Hz
Input Current(A)	0.079	0.079
Total Power(W)	17.51	17.56
Power Factor	0.983	0.982
I-THD	18.23	18.23
Off-state Power(W)	-	-

#### 3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	1533.27
Luminaire Efficacy(Lm/W)	-	87.31
Correlated Color Temperature (CCT)(K)	2772	-
Color Rendering Index (CRI)	86.1	-
R9	25	-
Chromaticity Coordinate (x,y)	x = 0.3765 y = 0.3716	-
Chromaticity Coordinate (u,v)	u = 0.2245 v = 0.3325	-
Chromaticity Coordinate (u',v')	u' = 0.2245 v' = 0.4987	-
Duv	-0.0012	-
Zone Lumens between 0-60 °	-	77.17%
Beam Angle(50%Imax)	-	C0/180=112.8° C90/270=112.6°

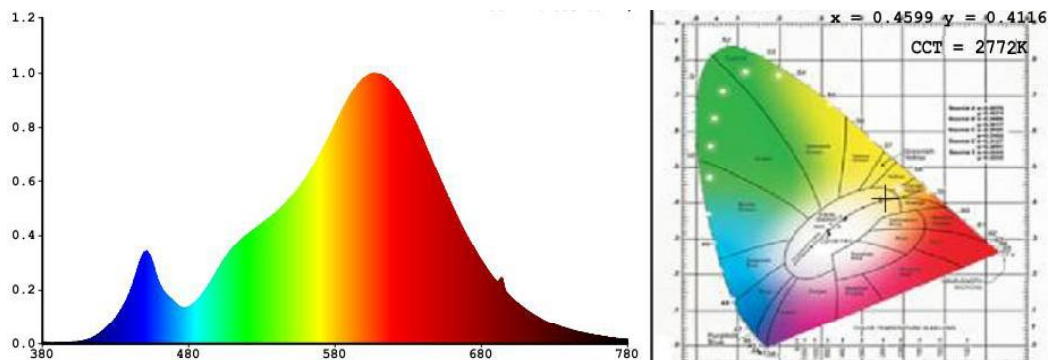
#### 3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
85	91	95	86	85	87	88	71
R9	R10	R11	R12	R13	R14	R15	-
25	78	85	66	87	97	81	-

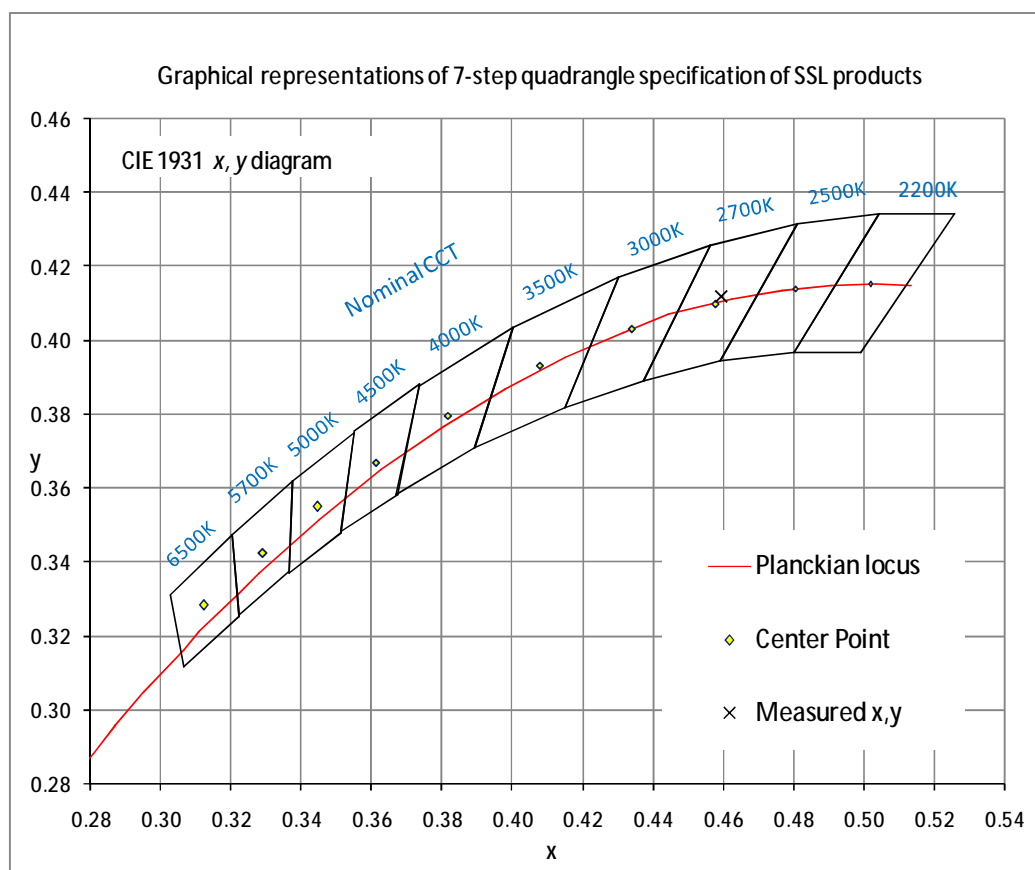
Note: N/A

## 4. Test Data

### 4.1 Spectral Distribution



### 4.2 ANSI Chromaticity Quadrangles Diagram



#### 4.3 Goniometry Test Data

CIE Type	Semi-Direct	Basic Luminous Shape	Circular
Spacing Criteria (0-180)	1.26	Luminous Length	0.31 m (Diameter)
Spacing Criteria (90-270)	1.26	Luminous Width	0.31 m (Diameter)
Spacing Criteria (Diagonal)	1.38	Luminous Height	0.00 m
Test Distance	29.97 m		

#### 4.4 Zonal Lumen Summary

Zone	Lumens	% Lamp	%Fixt
0-20	191.66	12.50	12.50
0-30	407.85	26.60	26.60
0-40	666.97	43.50	43.50
0-60	1183.68	77.20	77.20
0-80	1485.74	96.90	96.90
0-90	1521.00	99.20	99.20
10-90	1471.94	96.00	96.00
20-40	475.31	31.00	31.00
20-50	745.17	48.60	48.60
40-70	705.30	46.00	46.00
60-80	303.59	19.80	19.80
70-80	113.46	7.40	7.40
80-90	35.27	2.30	2.30
90-110	3.07	0.20	0.20
90-120	4.60	0.30	0.30
90-130	6.13	0.40	0.40
90-150	7.67	0.50	0.50
90-180	12.27	0.80	0.80
110-180	9.20	0.60	0.60
0-180	1533.27	100.00	100.00

Total Luminaire Efficiency = 100%

#### ZONAL LUMEN SUMMARY

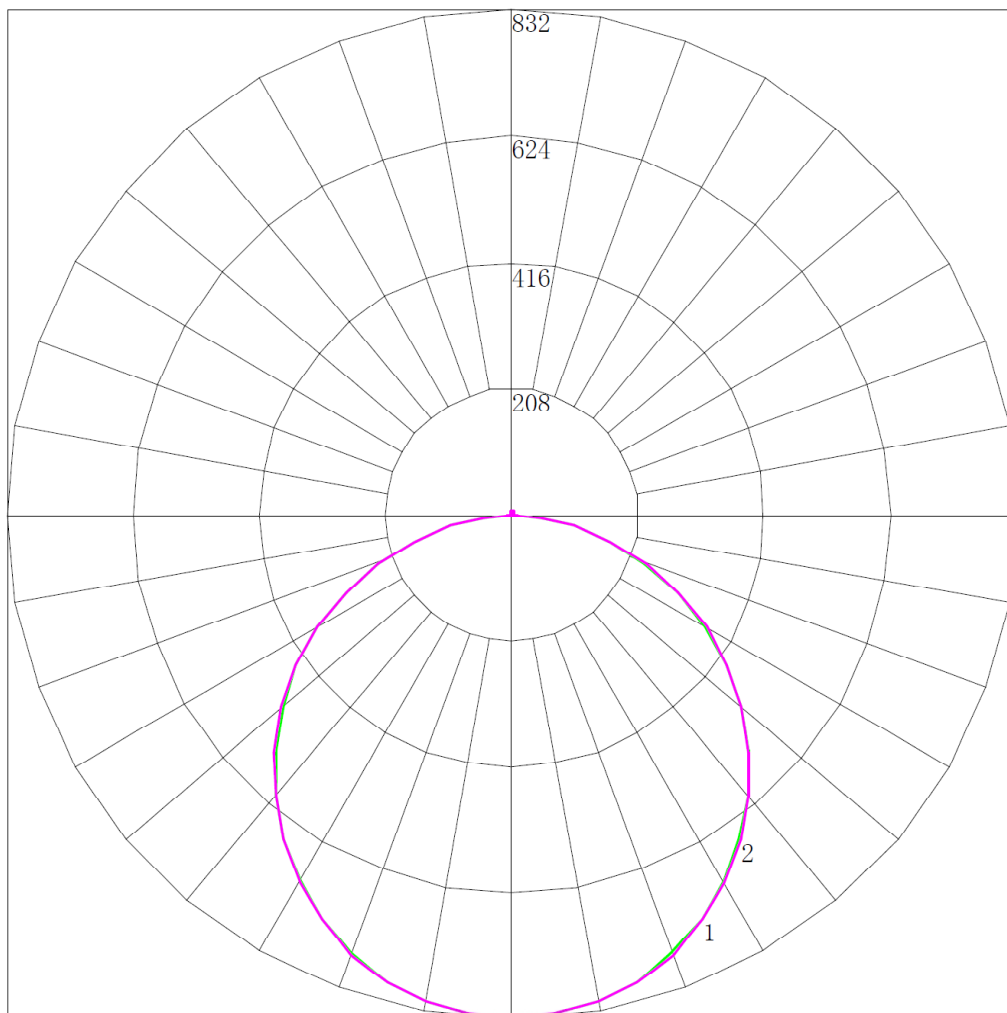
Zone	Lumens
0-10	78.75
10-20	225.24
20-30	340.82
30-40	410.34
40-50	426.72
50-60	388.13
60-70	299.89
70-80	179.12
80-90	55.92
90-100	3.43
100-110	1.18
110-120	1.57
120-130	1.98
130-140	2.34
140-150	2.62
150-160	2.66
160-170	1.94
170-180	0.62





LCTECH

#### 4.5 Polar Curves



Maximum Candela = 832.415 Located At Horizontal Angle = 0, Vertical Angle = 0

# 1 - Vertical Plane Through Horizontal Angles (0 - 180)

# 2 - Vertical Plane Through Horizontal Angles (90 - 270)



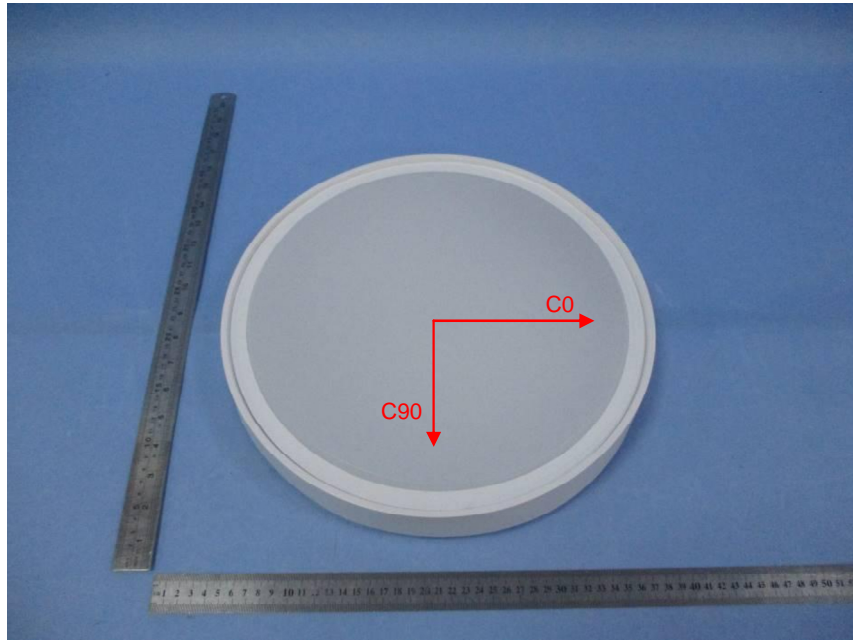
LCTECH



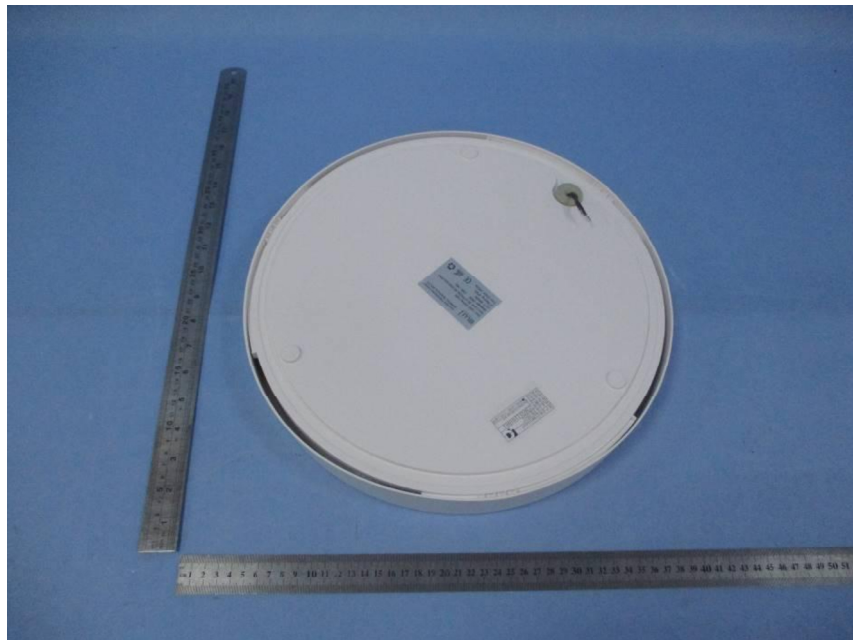
#### 4.6 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	832.415	832.415	832.415	832.415	832.415	832.415	832.415
5	828.767	828.606	828.790	828.908	828.821	829.115	829.453
10	816.379	817.359	817.150	817.233	817.369	817.930	818.004
15	797.686	797.883	797.990	797.571	798.368	798.323	800.012
20	771.831	772.502	771.735	772.128	771.935	771.534	773.266
25	739.444	739.413	739.333	739.329	738.792	739.280	739.448
30	699.490	700.509	700.473	700.975	705.625	700.336	700.635
35	655.212	656.059	655.553	655.220	655.207	654.993	656.516
40	606.789	606.989	606.738	606.137	605.333	606.425	606.960
45	551.160	553.072	553.126	559.577	552.268	552.785	553.426
50	494.584	494.851	495.172	493.772	494.714	495.389	494.719
55	433.414	434.488	434.602	433.619	434.419	434.672	434.244
60	369.407	369.864	377.501	369.914	369.000	369.835	370.056
65	301.976	303.506	302.546	302.789	301.921	302.012	303.082
70	234.139	235.614	235.268	234.921	235.206	235.085	235.799
75	167.924	175.980	169.004	168.039	168.558	168.902	168.163
80	103.241	104.497	103.888	104.107	104.173	104.556	103.532
85	45.945	45.464	45.864	45.620	45.698	46.461	45.621
90	10.540	9.624	9.928	9.759	9.249	9.207	9.637
95	1.171	1.150	1.058	0.945	0.853	0.941	1.017
100	0.946	0.924	0.878	0.877	0.831	0.852	0.928
105	1.126	1.037	1.103	1.125	1.078	1.120	1.149
110	1.351	1.375	1.373	1.350	1.370	1.390	1.415
115	1.531	1.578	1.486	1.575	1.549	1.613	1.680
120	1.802	1.803	1.756	1.777	1.841	1.838	1.945
125	2.207	2.209	2.184	2.227	2.223	2.219	2.255
130	2.658	2.592	2.567	2.587	2.627	2.600	2.652
135	2.973	2.930	2.927	2.969	3.076	3.048	3.050
140	3.558	3.516	3.445	3.532	3.593	3.540	3.625
145	4.189	4.147	4.075	4.117	4.221	4.168	4.332
150	4.910	4.936	4.818	4.859	4.828	4.908	5.040
155	5.901	5.815	5.742	5.714	5.749	5.804	5.968
160	6.802	6.740	6.642	6.614	6.602	6.678	6.852
165	7.162	7.077	6.957	6.861	6.872	7.015	6.985
170	6.531	6.559	6.686	6.860	6.961	6.928	6.454
175	6.531	6.672	6.890	7.175	7.253	7.172	7.029
180	3.679	3.679	3.679	3.679	3.679	3.679	3.679

## Appendix A Product Photo



Picture 1



Picture 2

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