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LCTECH GUANGDONG TESTING SERVICES CO.,LTD. LABORATORY

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 Spike

Models No.:

BLU-SPEAR-R10-10W-830-25-B

Test Date:	Apr. 15, 2021 to Apr. 22, 2021
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 Fax:+86-760-22833399 E-mail:Service@lccert.com http://www.lccert.com
Test Sites:	1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Template No.:	LC-RT-PL-001 Rev.1.4
Test Note:	/

Complied by:		**Reviewed by:**	
Kargel Yuan	Kargel Yuan	**Lin Qiu**	Lin
Apr. 26, 2021		**Apr. 26, 2021**	

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1. General

1.1 Product Information

Brand Name	BLUi Lighting
Product Type	LED Spike
Model Number	BLU-SPEAR-R10-10W-830-25-B
Rated Inputs	220-240VAC, 50/60Hz
Rated Power	10W
Rated Light output	880lm
Declared CCT	3000K
Power Supply	BLUi intergral LED driver
LED Package, Array or Module	NICHIA COB
Receipt Samples	1 unit
Sample Code of lab.	210408106002
Date of Receipt Samples	Apr. 8, 2021
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	2020-12-23	2021-12-22
AC Power supply	LC-I-989	APW-120N	2020-12-23	2021-12-22
Power analyzer	LC-I-928	WT210	2020-12-25	2021-12-24
Power analyzer	LC-I-954	WT210	2020-12-25	2021-12-24
Multimeter	LC-I-972	Fluke 17B	2020-07-20	2021-07-19
Photometric colorimetric electric system* (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp**	LC-PL-I-011	D204C	2020-07-14	2021-07-13
Luminous Flux Standard Lamp***	LC-PL-I-003	24V100W	2020-07-14	2021-07-13
Goniophotometer(with mirror)	LC-I-902	GMS2000	2021-04-22	2022-04-21
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2020-12-24	2021-12-23
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2020-12-24	2021-12-23

Note:

** Bandwidth of spectroradiometer is 1 nm.*

*** halogen lamp, 100W, omni-directional type, and its traceability to NIM.*

**** halogen lamp, 100W, 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°C ± 1°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 (50 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 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	229.97 V~50Hz	230.04 V~50Hz
Input Current(A)	0.046	0.046
Total Power(W)	9.82	9.84
Power Factor	0.938	0.938
I-THD	-	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	1184.24
Luminaire Efficacy(Lm/W)	-	120.35
Correlated Color Temperature (CCT)(K)	3053	-
Color Rendering Index (CRI)	82.9	-
R9	7	-
Chromaticity Coordinate (x,y)	x = 0.4334 y = 0.4032	-
Chromaticity Coordinate (u,v)	u = 0.2487 v = 0.3470	-
Chromaticity Coordinate (u',v')	u' = 0.2487 v' = 0.5205	-
Duv	0.0002	-
Zone Lumens between 0-60 º	-	99.20%
Beam Angle(50%Imax)	-	C0/180=26.6° C90/270=27.6°

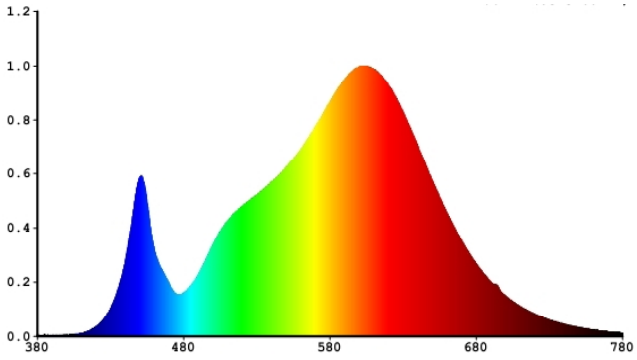
3.3 Color Rendering Details

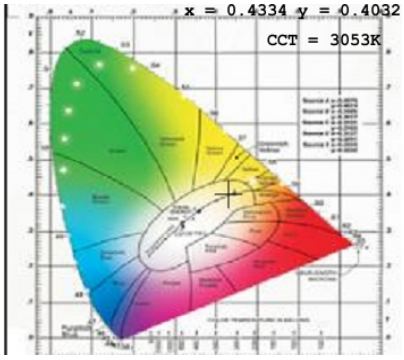
R1	R2	R3	R4	R5	R6	R7	R8
81	90	97	82	81	88	84	60
R9	R10	R11	R12	R13	R14	R15	-
7	78	82	71	83	99	74	-

Note: N/A

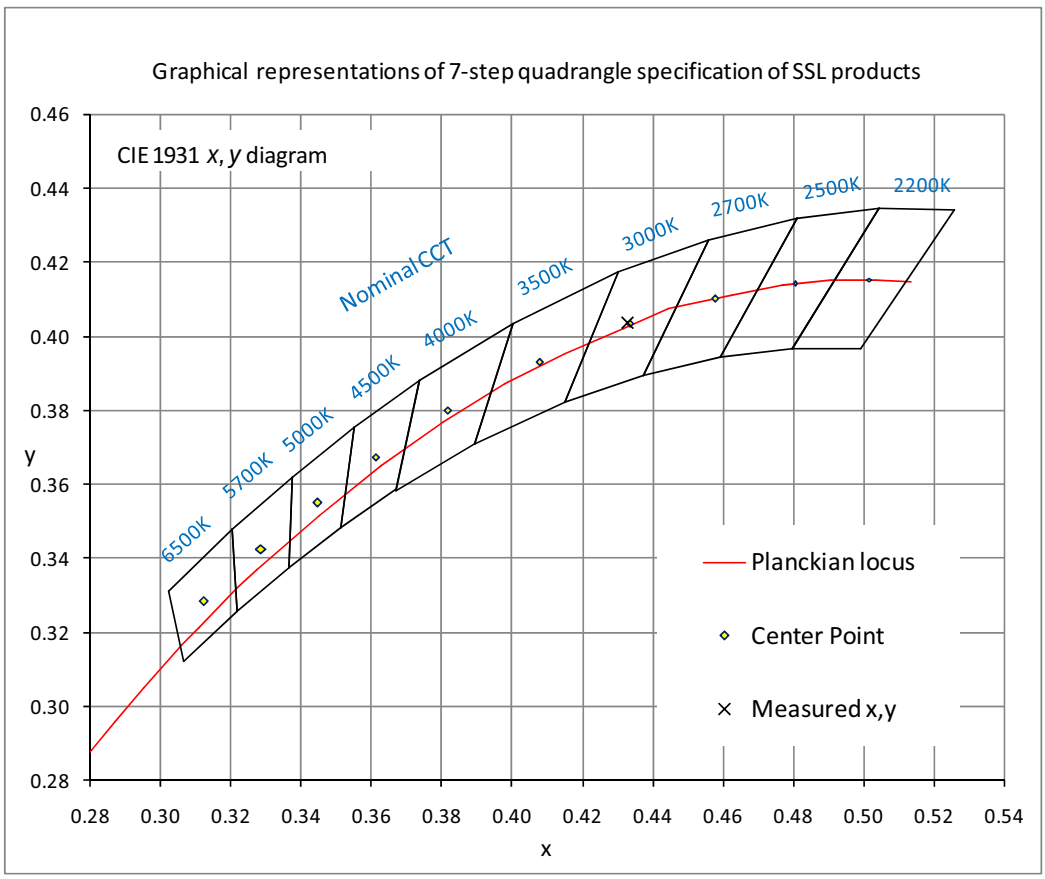
4. Test Data

4.1 Spectral Distribution





4.2 ANSI Chromaticity Quadrangles Diagram



4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Circular
Spacing Criteria (0-180)	0.48	Luminous Length	0.07 m (Diameter)
Spacing Criteria (90-270)	0.46	Luminous Width	0.07 m (Diameter)
Spacing Criteria (Diagonal)	0.48	Luminous Height	0.00 m
Test Distance	30.13 m		

4.4 Zonal Lumen Summary

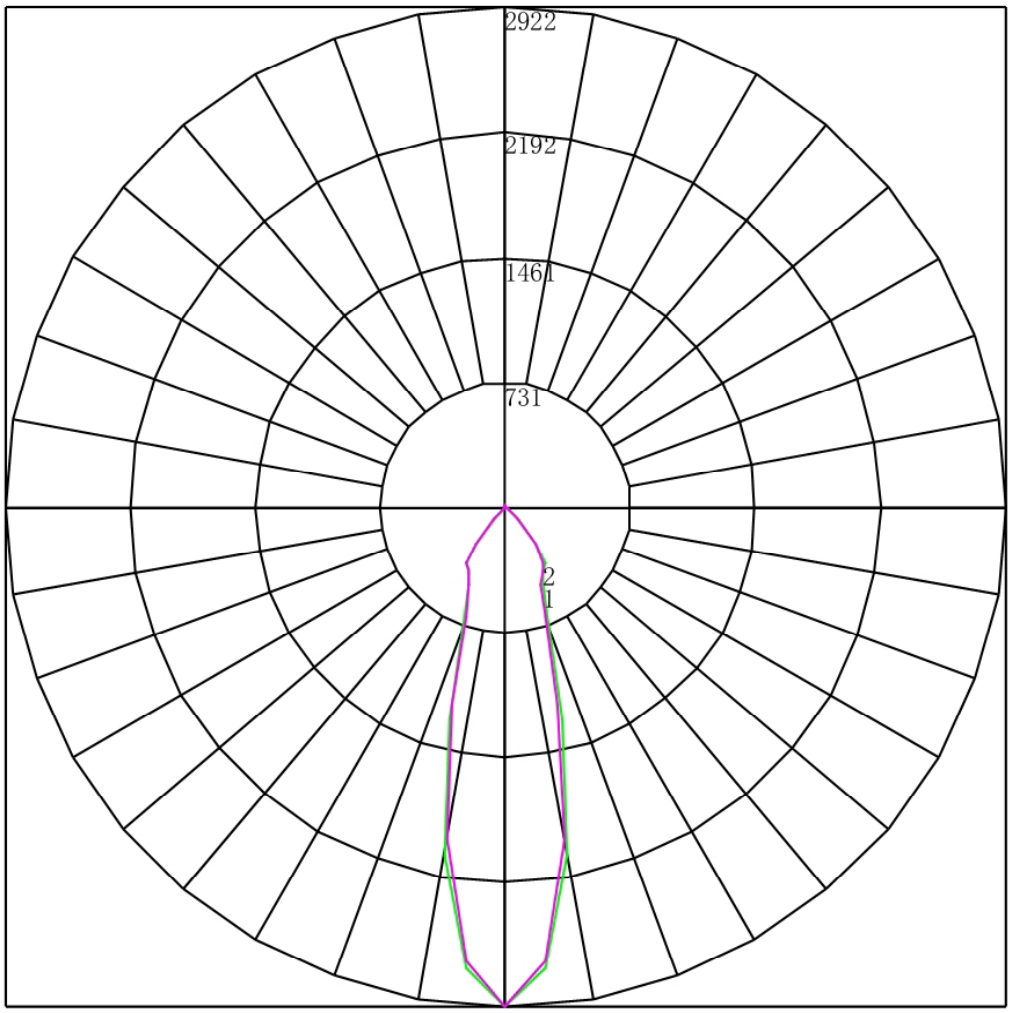
Zone	Lumens	%Lamp	%Fixt
0-20	587.55	49.60	49.60
0-30	830.23	70.10	70.10
0-40	1066.04	90.00	90.00
0-60	1175.00	99.20	99.20
0-80	1181.08	99.70	99.70
0-90	1181.21	99.70	99.70
10-90	944.36	79.70	79.70
20-40	478.50	40.40	40.40
20-50	574.29	48.50	48.50
40-70	113.56	9.60	9.60
60-80	6.08	0.50	0.50
70-80	1.48	0.10	0.10
80-90	0.14	0.00	0.00
90-110	0.00	0.00	0.00
90-120	0.00	0.00	0.00
90-130	0.02	0.00	0.00
90-150	0.50	0.00	0.00
90-180	3.02	0.30	0.30
110-180	3.02	0.30	0.30
0-180	1184.24	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	236.86
10-20	350.69
20-30	242.68
30-40	235.81
40-50	95.79
50-60	13.16
60-70	4.61
70-80	1.48
80-90	0.14
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.02
130-140	0.10
140-150	0.37
150-160	1.00
160-170	1.12
170-180	0.40

4.5 Polar Curves

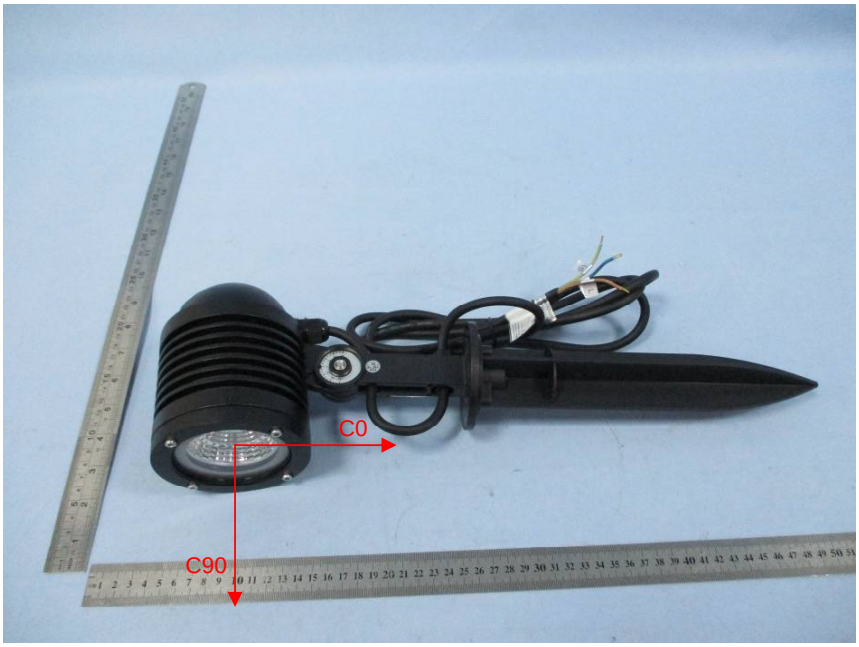


Maximum Candela = 2922.186 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	2922.186	2922.186	2922.186	2922.186	2922.186	2922.186	2922.186
5	2707.844	2713.647	2708.472	2698.390	2700.967	2697.514	2665.925
10	2075.191	2064.162	2044.904	2045.789	2043.187	2023.035	1973.929
15	1275.543	1253.364	1239.534	1216.974	1198.101	1185.889	1198.034
20	707.239	706.324	700.669	679.612	671.518	659.984	677.013
25	504.824	502.424	501.737	498.021	496.927	493.479	493.113
30	441.938	442.121	440.749	435.493	439.562	433.289	433.185
35	398.202	398.099	398.067	397.610	398.510	397.177	394.187
40	274.121	275.019	275.411	277.397	280.883	283.552	279.115
45	108.634	109.228	108.523	110.267	95.108	87.487	94.633
50	24.405	23.846	23.697	23.495	23.615	23.063	24.106
55	13.893	13.714	13.922	13.983	13.863	13.789	13.819
60	8.409	8.192	8.409	7.422	7.258	7.356	7.737
65	4.250	4.244	4.193	4.177	4.174	4.107	4.159
70	2.468	2.487	2.461	2.542	2.564	2.528	2.549
75	1.188	1.392	1.276	1.317	1.339	1.309	1.252
80	0.411	0.434	0.478	0.499	0.476	0.474	0.492
85	0.046	0.000	0.000	0.023	0.022	0.022	0.000
90	0.000	0.000	0.000	0.000	0.000	0.000	0.000
95	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000
105	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110	0.000	0.000	0.000	0.000	0.000	0.000	0.000
115	0.000	0.000	0.000	0.000	0.000	0.000	0.000
120	0.000	0.000	0.000	0.000	0.000	0.000	0.000
125	0.046	0.023	0.000	0.023	0.000	0.000	0.000
130	0.137	0.069	0.046	0.045	0.091	0.090	0.045
135	0.046	0.114	0.137	0.091	0.137	0.135	0.134
140	0.229	0.228	0.273	0.227	0.250	0.226	0.224
145	0.548	0.525	0.524	0.477	0.500	0.497	0.537
150	1.234	1.187	1.185	1.181	1.090	1.174	1.163
155	2.239	2.213	2.188	2.248	2.224	2.189	2.102
160	3.245	3.263	3.236	3.246	3.268	3.273	3.265
165	4.159	4.176	4.170	4.132	4.130	4.063	4.114
170	4.524	4.495	4.535	4.518	4.539	4.469	4.428
175	4.433	4.495	4.512	4.450	4.493	4.446	4.472
180	2.255	2.255	2.255	2.255	2.255	2.255	2.255

Appendix A Product Photo



Picture 1

Picture 2

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