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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 NEON FLEX

Models No.:

BLU-GFLX-1614V-12W-830-2M

**Test Date:** Aug. 20, 2019 to Aug. 22, 2019

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**Test Note:**

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## 1. General

### 1.1 Product Information

Brand Name	BLUi
Product Type	LED NEON FLEX
Model Number	BLU-GFLX-1614V-12W-830-2M
Rated Inputs	24VDC
Rated Power	12W
Rated Light output	825lm
Declared CCT	3000K
Power Supply	Integrated in luminaire
LED Package, Array or Module	LUMILEDS
Receipt Samples	1 unit
Sample Code of lab.	190812105011
Date of Receipt Samples	Aug. 12, 2019
Note	-

## 1.2 Standards or methods

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

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011 or 2015 or 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	2019-01-08	2020-01-07
AC Power supply	LC-I-989	APW-120N	2019-01-08	2020-01-07
Power analyzer	LC-I-928	WT210	2019-01-02	2020-01-01
Power analyzer	LC-I-954	WT210	2019-01-08	2020-01-07
Multimeter	LC-I-972	Fluke 17B	2019-07-29	2020-07-28
Photometric colorimetric electric system* (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp**	LC-PL-I-011	D204C	2018-11-21	2019-11-20
Luminous Flux Standard Lamp***	LC-PL-I-003	24V100W	2018-11-21	2019-11-20
Goniophotometer(with mirror)	LC-I-902	GMS2000	2019-05-06	2020-05-05
Wireless temperature transmitter	LC-I-978	DWRF-B	2019-01-07	2020-01-06
Wireless temperature transmitter	LC-I-979	DWRF-B	2019-01-07	2020-01-06

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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ ; the air flow around the sample(s) being tested did not affect the performance.

### 2.2 Power Supply Characteristics

The voltage of DC power supply (instantaneous 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 DC voltage and current were less than 0.1 percent.

### 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	24.01 V	24.00 V
Input Current(A)	0.509	0.509
Total Power(W)	12.21	12.22
Power Factor	1.000	1.000
I-THD	-	-
Off-state Power(W)	-	-

#### 3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	826.96
Luminaire Efficacy(Lm/W)	-	67.67
Correlated Color Temperature (CCT)(K)	2950	-
Color Rendering Index (CRI)	83.7	-
R9	13	-
Chromaticity Coordinate (x,y)	x = 0.4417 y = 0.4076	-
Chromaticity Coordinate (u,v)	u = 0.2521 v = 0.3490	-
Chromaticity Coordinate (u',v')	u' = 0.2521 v' = 0.5235	-
Duv	0.0008	-
Zone Lumens between 0-60 °	-	77.80%
Beam Angle(50%Imax)	-	C0/180=126.2° C90/270=113.1°

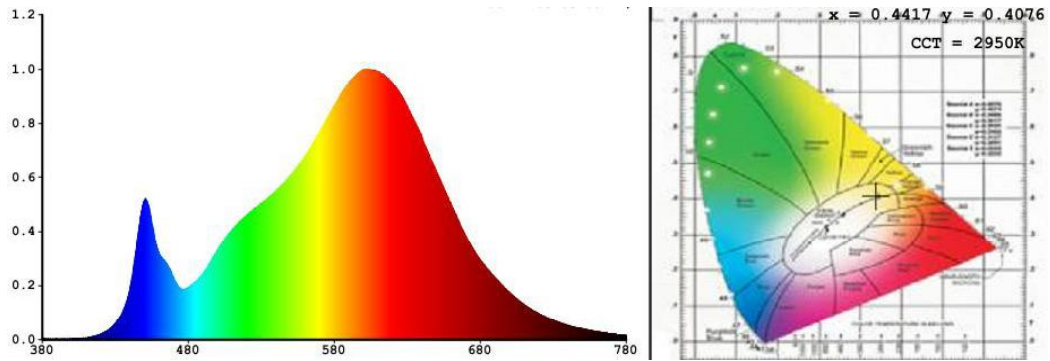
#### 3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
82	92	97	82	82	90	84	61
R9	R10	R11	R12	R13	R14	R15	-
13	81	82	73	84	99	75	-

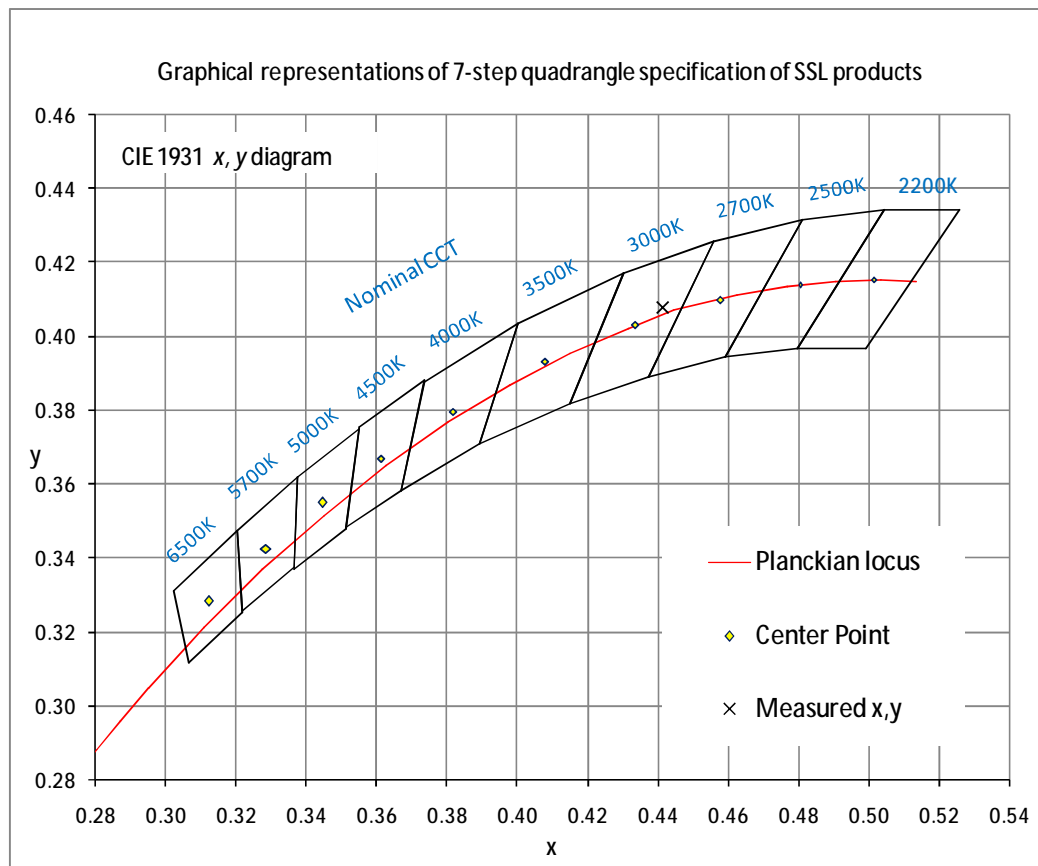
Note: N/A

## 4. Test Data

### 4.1 Spectral Distribution



### 4.2 ANSI Chromaticity Quadrangles Diagram





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**4.3 Goniometry Test Data**

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.26	Luminous Length	1.00 m
Spacing Criteria (90-270)	1.34	Luminous Width	0.01 m
Spacing Criteria (Diagonal)	1.44	Luminous Height	0.03 m
Test Distance	30.00 m		

**4.4 Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-20	86.60	10.50	10.50
0-30	185.25	22.40	22.40
0-40	306.25	37.00	37.00
0-60	556.26	67.30	67.30
0-80	721.41	87.20	87.20
0-90	755.44	91.40	91.40
10-90	733.16	88.70	88.70
20-40	219.66	26.60	26.60
20-50	348.43	42.10	42.10
40-70	348.98	42.20	42.20
60-80	165.15	20.00	20.00
70-80	66.18	8.00	8.00
80-90	34.03	4.10	4.10
90-110	37.68	4.60	4.60
90-120	50.60	6.10	6.10
90-130	59.87	7.20	7.20
90-150	69.29	8.40	8.40
90-180	71.53	8.60	8.60
110-180	33.85	4.10	4.10
0-180	826.96	100.00	100.00

Total Luminaire Efficiency = 100.00%

**ZONAL LUMEN SUMMARY**

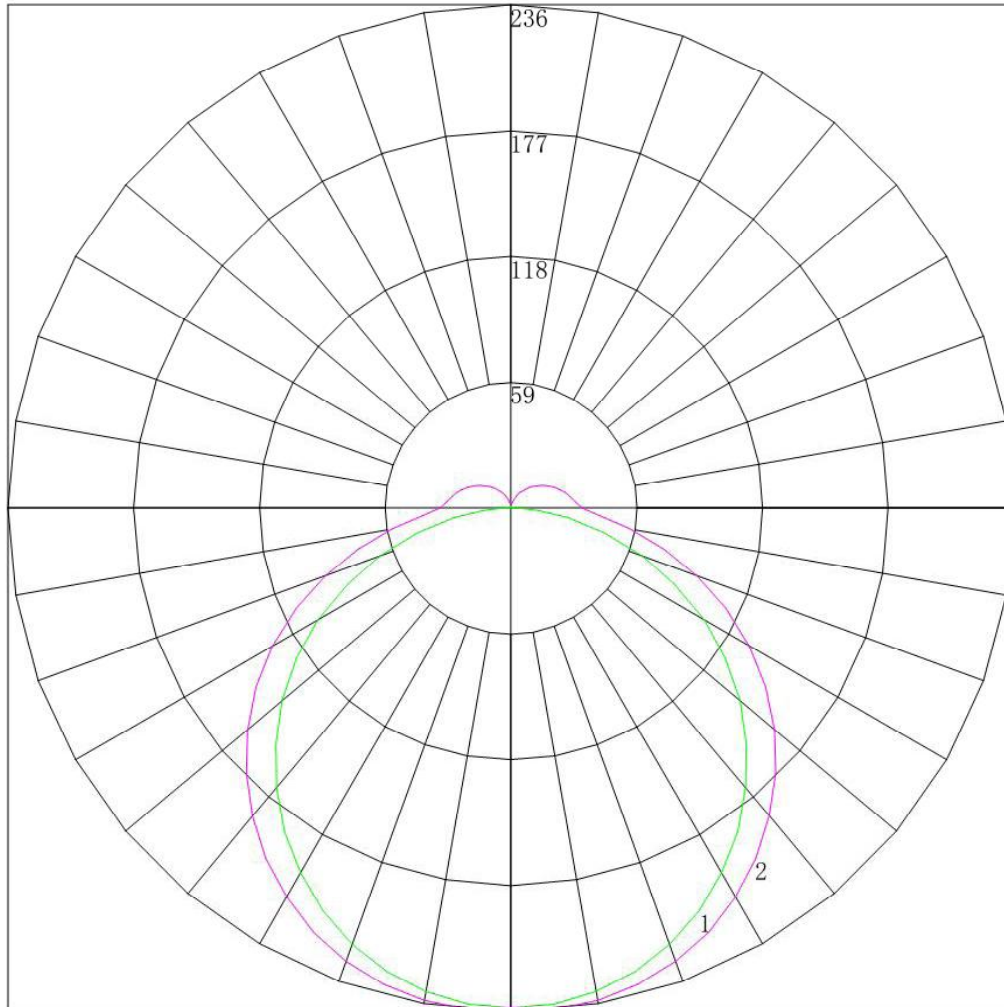
Zone	Lumens
0-10	22.28
10-20	64.31
20-30	98.66
30-40	121.00
40-50	128.77
50-60	121.24
60-70	98.97
70-80	66.18
80-90	34.03
90-100	20.89
100-110	16.79
110-120	12.92
120-130	9.28
130-140	6.01
140-150	3.41
150-160	1.56
160-170	0.54
170-180	0.13





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4.5 Polar Curves



Maximum Candela = 236.41 Located At Horizontal Angle = 90, Vertical Angle = 5  
# 1 - Vertical Plane Through Horizontal Angles (0 - 180)  
# 2 - Vertical Plane Through Horizontal Angles (90 - 270)



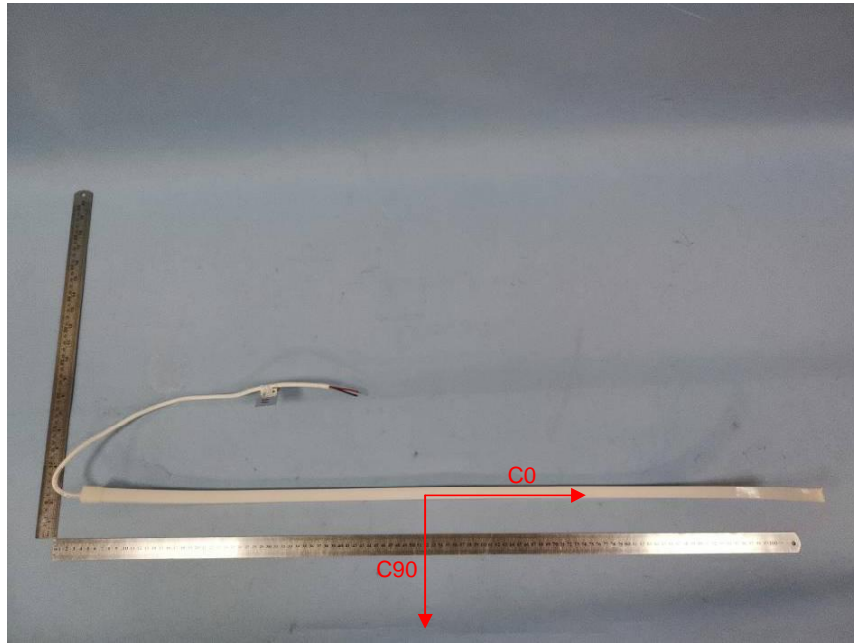
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4.6 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
<b>0</b>	234.804	234.804	234.804	234.804	234.804	234.804	234.804
<b>5</b>	233.805	233.736	233.902	233.972	234.220	234.381	236.410
<b>10</b>	230.536	230.667	231.238	231.722	232.427	232.680	234.857
<b>15</b>	225.270	225.462	226.744	227.739	228.728	229.192	231.441
<b>20</b>	218.188	218.711	220.378	221.888	223.616	224.230	226.385
<b>25</b>	208.926	209.869	211.956	214.149	216.263	217.362	219.739
<b>30</b>	197.804	199.254	201.793	204.629	207.448	208.705	210.965
<b>35</b>	185.728	187.344	190.166	193.985	196.865	198.710	200.863
<b>40</b>	171.518	173.479	177.370	181.652	184.982	186.987	188.947
<b>45</b>	156.309	158.886	162.829	167.610	171.815	174.016	175.796
<b>50</b>	140.601	143.270	147.380	152.601	156.900	159.791	161.622
<b>55</b>	122.895	126.040	131.097	136.580	141.407	144.606	146.167
<b>60</b>	104.963	108.037	113.301	119.252	124.229	127.811	129.426
<b>65</b>	84.669	88.762	94.783	101.204	106.733	110.255	111.225
<b>70</b>	65.602	69.578	76.221	82.728	88.252	92.200	92.803
<b>75</b>	45.490	50.281	57.027	63.958	69.797	73.410	74.435
<b>80</b>	27.194	31.800	39.004	46.226	52.214	55.741	56.602
<b>85</b>	12.666	16.730	24.482	31.418	37.141	40.330	42.006
<b>90</b>	2.996	8.843	16.421	23.385	28.620	31.898	33.367
<b>95</b>	0.499	7.024	14.457	21.180	26.311	29.505	30.409
<b>100</b>	0.454	5.683	12.875	19.289	24.383	27.470	28.460
<b>105</b>	0.454	4.820	11.383	17.556	22.386	25.501	26.513
<b>110</b>	0.454	3.978	10.096	15.958	20.413	23.354	24.430
<b>115</b>	0.363	3.410	9.058	14.269	18.551	21.295	22.304
<b>120</b>	0.318	2.910	7.974	12.897	16.689	19.260	20.180
<b>125</b>	0.409	2.296	7.025	11.412	14.871	17.113	17.966
<b>130</b>	0.363	1.728	6.009	9.904	13.145	15.010	15.883
<b>135</b>	0.363	1.432	4.947	8.464	11.239	13.020	13.847
<b>140</b>	0.454	1.228	4.089	7.158	9.489	11.118	11.634
<b>145</b>	0.454	1.159	2.983	5.852	7.986	9.217	9.685
<b>150</b>	0.590	1.046	2.191	4.615	6.325	7.472	8.003
<b>155</b>	0.636	1.068	1.897	2.994	4.779	5.839	6.189
<b>160</b>	0.908	1.091	1.603	2.205	2.961	3.738	3.747
<b>165</b>	0.999	1.159	1.513	1.867	2.152	2.392	2.643
<b>170</b>	1.090	1.182	1.355	1.597	1.704	1.811	1.941
<b>175</b>	1.180	1.182	1.242	1.327	1.345	1.341	1.502
<b>180</b>	1.234	1.234	1.234	1.234	1.234	1.234	1.234

### Appendix A Product Photo



Picture 1



Picture 2

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