



**IESNA  
SUSTAINING  
MEMBER**

Ref. No.: LCZF20060381

Version: 1.0

Date of issue: Jul. 8, 2020

Total pages: 11



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 Panel light

Models No.:

BLU-PLANE-2X2-42W-940-65

**Test Date:** Jul. 1, 2020

**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:**

**Kargel Yuan**

**Jul. 8, 2020**

**Reviewed by:**

**Lin Qiu**

**Jul. 8, 2020**

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 Federal 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



LCTECH



## 1. General

### 1.1 Product Information

Brand Name	BLUi
Product Type	LED Panel light
Model Number	BLU-PLANE-2X2-42W-940-65
Rated Inputs	220-240VAC, 50/60Hz
Rated Power	42W
Rated Light output	3650lm
Declared CCT	4000K
Power Supply	TRIDONIC
LED Package, Array or Module	Samsung
Receipt Samples	1 unit
Sample Code of lab.	200630108003
Date of Receipt Samples	Jun. 30, 2020
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	2020-01-06	2021-01-05
AC Power supply	LC-I-989	APW-120N	2020-01-06	2021-01-05
Power analyzer	LC-I-928	WT210	2019-12-29	2020-12-28
Power analyzer	LC-I-954	WT210	2019-12-26	2020-12-25
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	2019-08-01	2020-07-31
Luminous Flux Standard Lamp****	LC-PL-I-003	24V100W	2019-08-01	2020-07-31
Goniophotometer(with mirror)	LC-I-902	GMS2000	2020-04-23	2021-04-22
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2020-01-03	2021-01-02
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2020-01-03	2021-01-02

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 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  $\pm 0.2$  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	230.01 V~50Hz	230.01 V~50Hz
Input Current(A)	0.184	0.183
Total Power(W)	40.09	40.00
Power Factor	0.948	0.951
I-THD	-	-
Off-state Power(W)	-	-

#### 3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	-	3279.39
Luminaire Efficacy(Lm/W)	-	81.98
Correlated Color Temperature (CCT)(K)	4028	-
Color Rendering Index (CRI)	93.4	-
R9	72	-
Chromaticity Coordinate (x,y)	x = 0.3783 y = 0.3726	-
Chromaticity Coordinate (u,v)	u = 0.2254 v = 0.3329	-
Chromaticity Coordinate (u',v')	u' = 0.2254 v' = 0.4994	-
Duv	-0.0014	-
Zone Lumens between 0-60 °	-	71.40%
Beam Angle(50%Imax)	-	C0/180=112.4° C90/270=112.0°

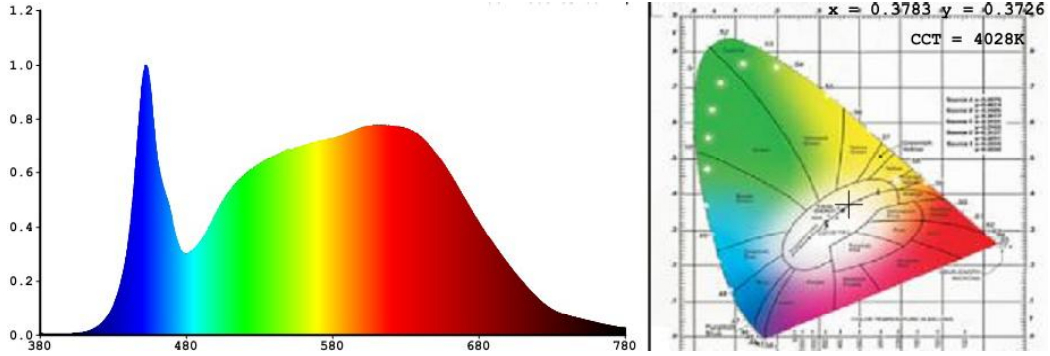
#### 3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
94	96	95	93	93	92	95	89
R9	R10	R11	R12	R13	R14	R15	-
72	88	93	70	95	97	93	-

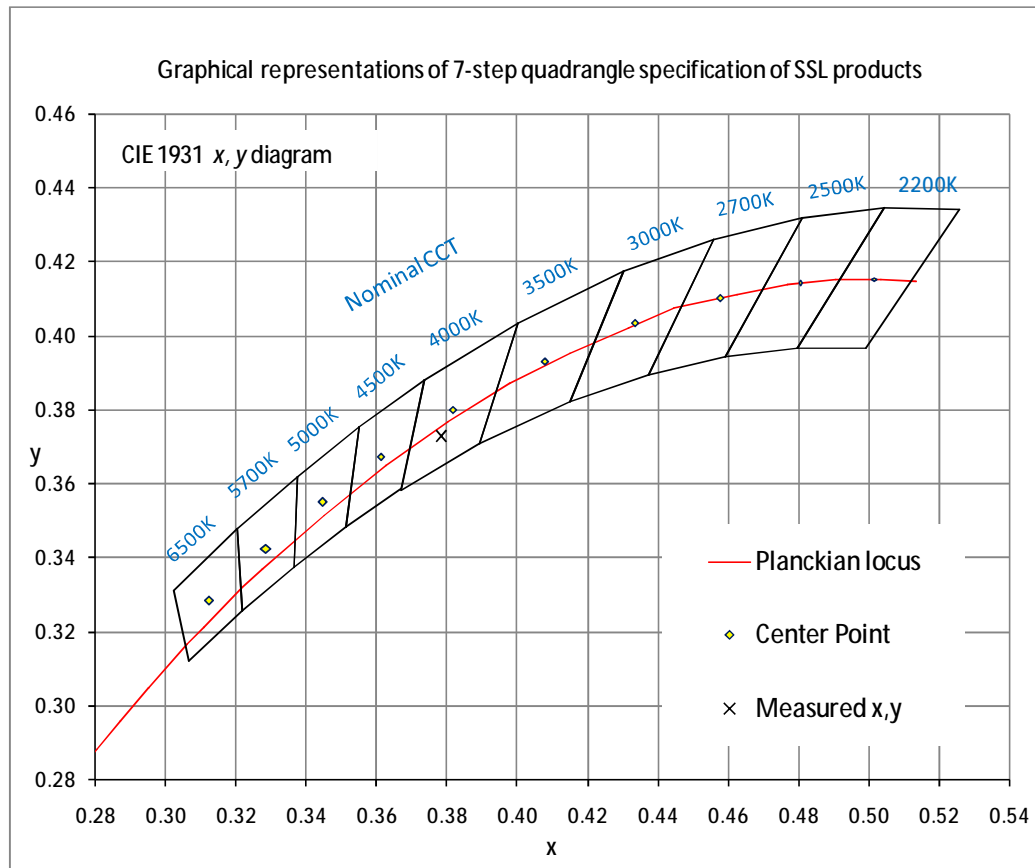
Note: N/A

## 4. Test Data

### 4.1 Spectral Distribution



### 4.2 ANSI Chromaticity Quadrangles Diagram





LCTECH



**4.3 Goniometry Test Data**

CIE Type	Direct	Basic Luminous Shape	Rectangular
Spacing Criteria (0-180)	1.26	Luminous Length	0.52 m
Spacing Criteria (90-270)	1.26	Luminous Width	0.52 m
Spacing Criteria (Diagonal)	1.38	Luminous Height	0.00 m
Test Distance	29.77 m		

**4.4 Zonal Lumen Summary**

Zone	Lumens	%Lamp	%Fixt
0-20	418.85	12.80	12.80
0-30	888.77	27.10	27.10
0-40	1454.85	44.40	44.40
0-60	2572.69	78.50	78.50
0-80	3204.34	97.70	97.70
0-90	3267.5	99.60	99.60
10-90	3159.03	96.30	96.30
20-40	1036.00	31.60	31.60
20-50	1623.44	49.50	49.50
40-70	1520.16	46.40	46.40
60-80	631.65	19.30	19.30
70-80	229.34	7.00	7.00
80-90	63.15	1.90	1.90
90-110	3.99	0.10	0.10
90-120	5.26	0.20	0.20
90-130	6.51	0.20	0.20
90-150	8.98	0.30	0.30
90-180	11.89	0.40	0.40
110-180	7.90	0.20	0.20
0-180	3279.39	100.00	100.00

Total Luminaire Efficiency = 100.00%

**ZONAL LUMEN SUMMARY**

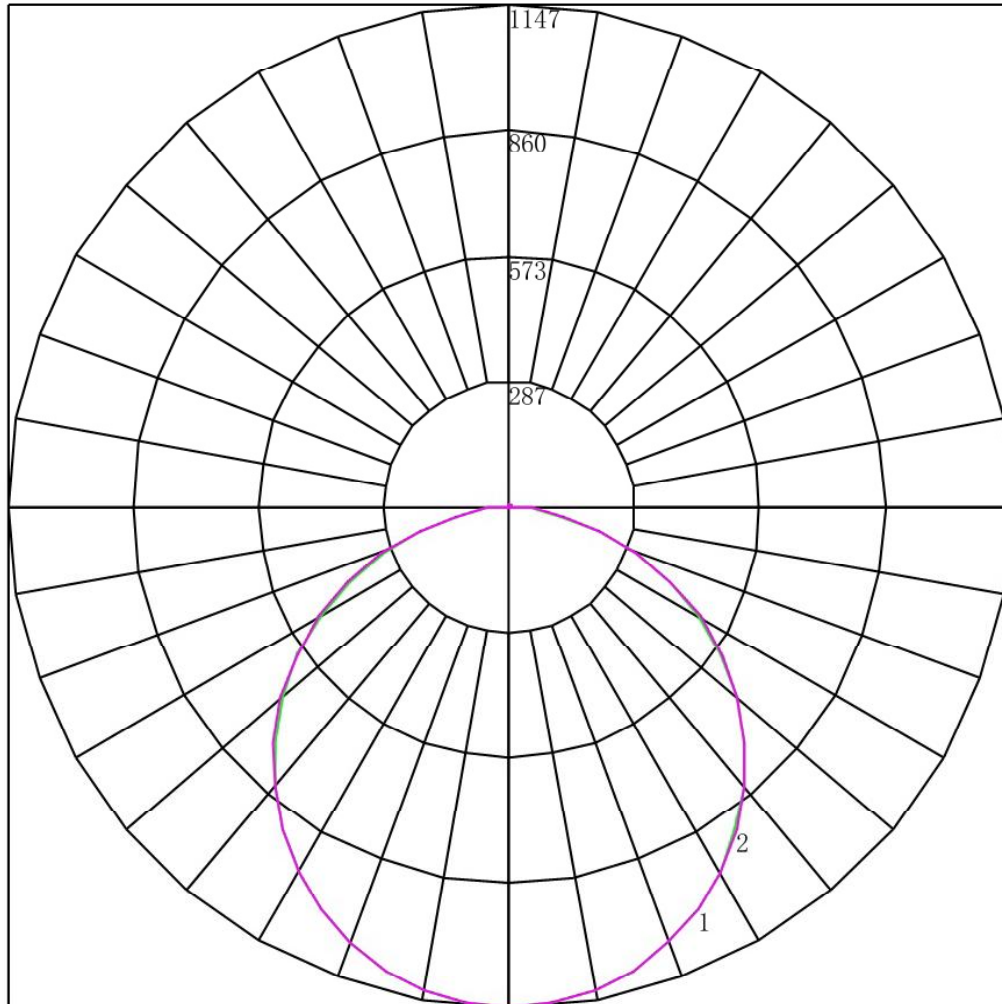
Zone	Lumens
0-10	108.47
10-20	310.38
20-30	469.93
30-40	566.07
40-50	587.43
50-60	530.41
60-70	402.32
70-80	229.34
80-90	63.15
90-100	2.46
100-110	1.53
110-120	1.27
120-130	1.25
130-140	1.15
140-150	1.32
150-160	1.39
160-170	1.11
170-180	0.41





LCTECH

4.5 Polar Curves



Maximum Candela = 1146.797 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



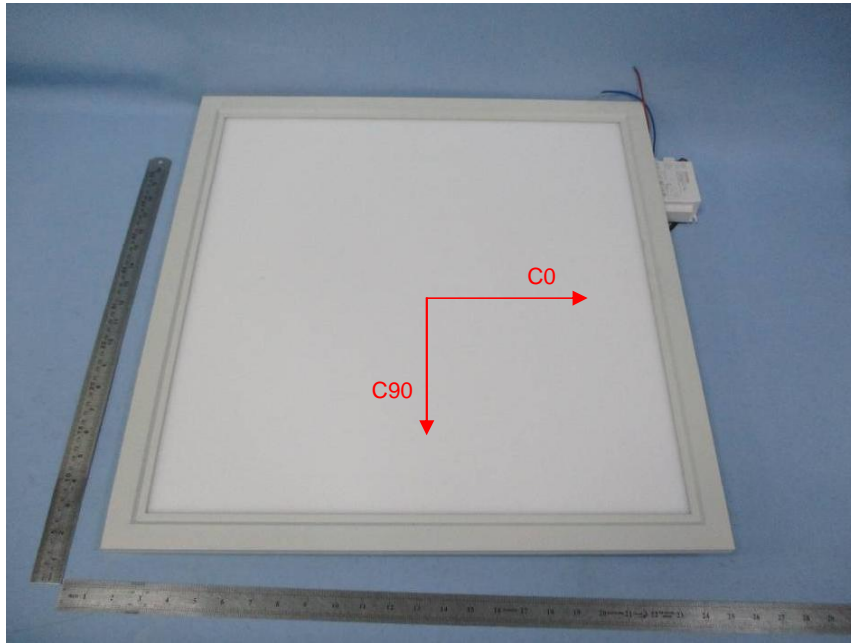
4.6 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
<b>0</b>	1146.797	1146.797	1146.797	1146.797	1146.797	1146.797	1146.797
<b>5</b>	1141.655	1141.102	1141.722	1141.261	1142.163	1141.345	1141.527
<b>10</b>	1125.742	1125.636	1126.165	1125.385	1126.357	1125.680	1126.119
<b>15</b>	1099.855	1099.047	1099.950	1099.146	1100.442	1100.287	1099.951
<b>20</b>	1063.508	1063.661	1063.917	1064.006	1065.548	1064.946	1064.130
<b>25</b>	1018.429	1017.816	1019.198	1019.677	1019.902	1020.320	1019.321
<b>30</b>	965.548	964.704	965.569	966.048	973.386	967.563	966.586
<b>35</b>	903.005	902.707	904.208	904.493	906.220	905.144	905.571
<b>40</b>	834.211	834.661	836.242	835.918	838.227	837.363	837.029
<b>45</b>	757.173	759.435	761.628	769.489	762.299	762.670	761.756
<b>50</b>	677.076	678.315	678.660	679.305	680.895	680.885	682.012
<b>55</b>	591.971	592.299	593.254	594.013	594.215	593.895	595.272
<b>60</b>	501.014	500.765	511.510	501.635	502.280	502.515	503.838
<b>65</b>	404.340	404.423	405.378	406.334	406.910	407.060	407.091
<b>70</b>	308.596	308.059	308.915	309.749	310.853	311.316	310.299
<b>75</b>	212.897	223.710	214.446	214.028	216.036	217.102	215.368
<b>80</b>	123.137	123.906	126.026	126.876	128.403	127.872	127.432
<b>85</b>	50.088	50.187	50.060	50.507	51.056	51.805	52.292
<b>90</b>	9.441	3.656	3.590	3.609	3.414	3.479	3.144
<b>95</b>	1.640	1.640	1.728	1.727	1.796	1.750	1.727
<b>100</b>	1.551	1.529	1.596	1.616	1.574	1.595	1.550
<b>105</b>	1.463	1.485	1.463	1.417	1.441	1.462	1.417
<b>110</b>	1.330	1.329	1.285	1.262	1.264	1.307	1.284
<b>115</b>	1.241	1.263	1.197	1.262	1.264	1.241	1.240
<b>120</b>	1.285	1.307	1.352	1.306	1.308	1.329	1.328
<b>125</b>	1.374	1.418	1.418	1.439	1.441	1.418	1.461
<b>130</b>	1.463	1.418	1.396	1.417	1.419	1.418	1.417
<b>135</b>	1.374	1.462	1.396	1.439	1.419	1.418	1.417
<b>140</b>	1.729	1.706	1.684	1.683	1.707	1.662	1.683
<b>145</b>	2.083	2.127	2.061	2.081	2.106	2.105	2.125
<b>150</b>	2.615	2.526	2.571	2.524	2.483	2.548	2.612
<b>155</b>	3.058	3.013	3.036	3.033	3.059	3.036	3.011
<b>160</b>	3.502	3.523	3.524	3.543	3.503	3.501	3.498
<b>165</b>	3.945	4.011	3.967	3.941	3.946	3.922	3.985
<b>170</b>	4.388	4.454	4.366	4.406	4.412	4.432	4.428
<b>175</b>	4.743	4.742	4.720	4.716	4.678	4.720	4.738
<b>180</b>	2.434	2.434	2.434	2.434	2.434	2.434	2.434

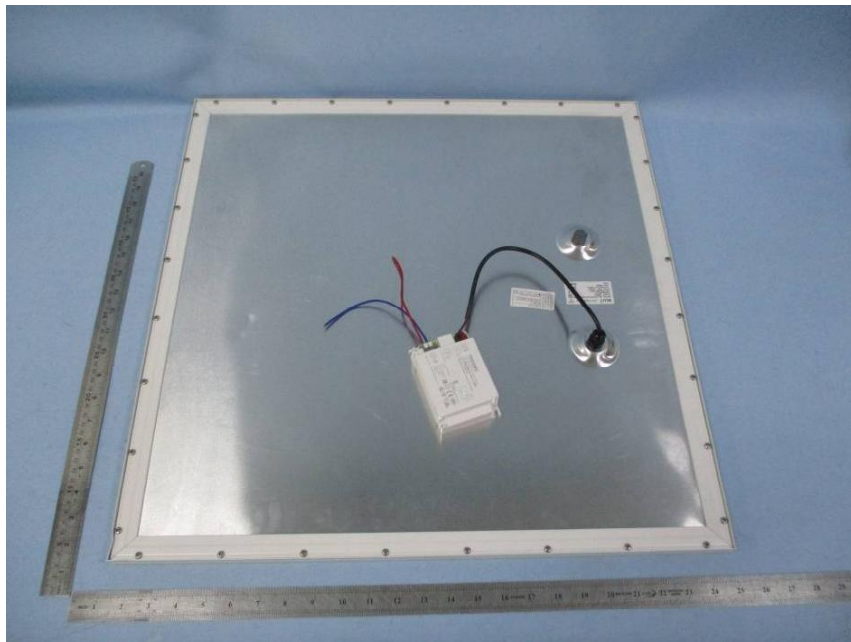


LCTECH

Appendix A Product Photo



Picture 1



Picture 2

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