



# TEST REPORT

**Applicant:** SHENZHEN DIANFEI ELECTRONIC CO., LTD.  
**Address:** ROOM 1805, BLOCK A, JIAHE HUAQIANG BUILDING SHENNAN ROAD  
FUTIAN DISTRICT SHENZHEN CHINA

**The following sample(s) was/were submitted and identified on behalf of the client as:**

**Product name:** LED

**Manufacturer:** SHENZHEN DIANFEI ELECTRONIC CO., LTD.  
**Address:** ROOM 1805, BLOCK A, JIAHE HUAQIANG BUILDING SHENNAN ROAD  
FUTIAN DISTRICT SHENZHEN CHINA

**Sample Received Date:** Aug. 21, 2014  
**Testing Period:** Aug. 21, 2014– Aug. 27, 2014

**Test Requirement:**

1. As specified by client, to screen Lead(Pb), Cadmium(Cd), Mercury(Hg), Chromium(Cr) and Bromine(Br) in the submitted sample(s) by XRF.
2. As specified by client, when screening results exceed the XRF screening limit in IEC62321: 2013 Edition 1.0, further use of chemical methods are required to test the Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs) and Polybrominated Diphenyl Ethers(PBDEs) in the submitted samples in accordance with Regulation 2011/65/EU.

**Conclusion:**

Pass

**Test Result(s):** Please refer to the following page(s);

**Test Method:** Please refer to the following page(s);

**Wrote by:**

*Sally*

**Reviewed by:**



**Approved by:**

*Jack*

**Date:**

2014-08-27

**Shenzhen NTEK Testing Technology Co., Ltd.**

Address: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.  
Tel: (86)-0755-61156588 Fax: (86)-0755-61156599 Http: www.ntek.org.cn

**Test Result(s):**

## 1. Diode

Sample No.	Sample Description	Tested Items	XRF Screening Test	Chemical Test (mg/kg)	Conclusion
1	Lamp cap	Pb	BL	/	PASS
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI) )	BL	/	
		Br(PBBs&PBDEs)	IN	N.D.	
2	Metal pin	Pb	BL	/	PASS
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI) )	BL	/	
		Br(PBBs&PBDEs)	/	/	

**Note:**

- N.D. = Not Detected (<MDL)
- MDL = Method Detection Limit
- mg/kg = ppm = parts per million
- /=Not Regulated or Not Applicable
- BL = Under the XRF screening limit
- IN = Further chemical test will be conducted when the screening result inconclusive
- OL = Further chemical test will be conducted while the result is above the screening limit.
- Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.
- Positive = Presence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is equal to or greater than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.

**Remark:**

- 1.The screening results are only used for reference.
- 2.When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.

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### Test Method:

#### 1. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC 62321:2008 Ed.1

Sec.6&Annex D

Element	Limit of IEC 62321:2008 Ed.1 Sec.6&Annex D (unit:mg/kg)		MDL	
	Polymers and metals	Composite material	Polymers	Other material
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma)$ $\leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma)$ $\leq OL$	10 mg/kg	50 mg/kg
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma)$ $\leq OL$	$LOD < X < (150+3\sigma) \leq OL$	10 mg/kg	50 mg/kg
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma)$ $\leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma)$ $\leq OL$	10 mg/kg	50 mg/kg
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$	10 mg/kg	50 mg/kg
Br	$BL \leq (300-3\sigma) < X$	$BL \leq (250-3\sigma) < X$	10 mg/kg	50 mg/kg

Note: -BL = Under the XRF screening limit

-OL = Further chemical test will be conducted while result is above the screening limit.

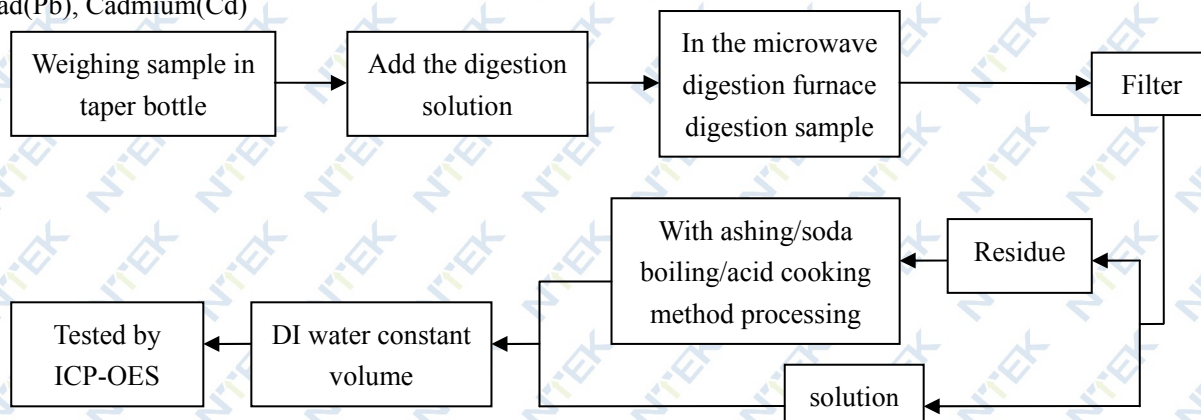
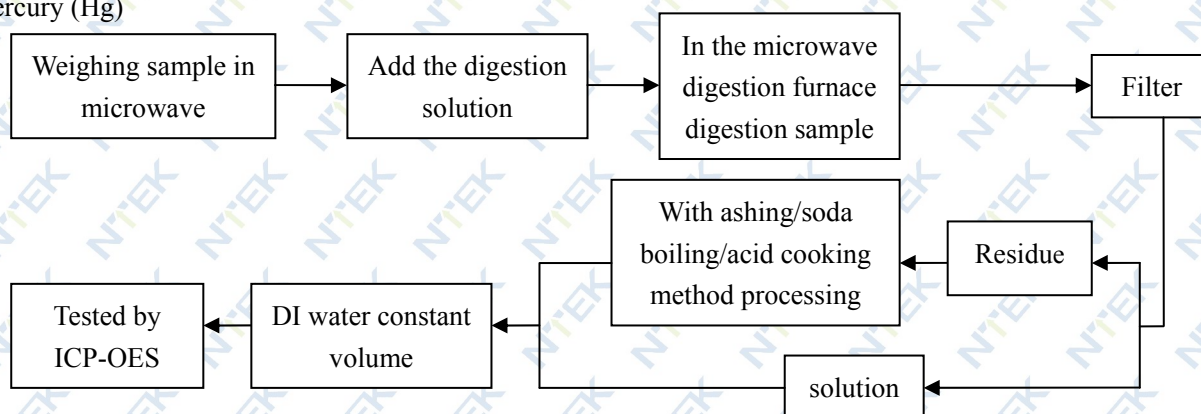
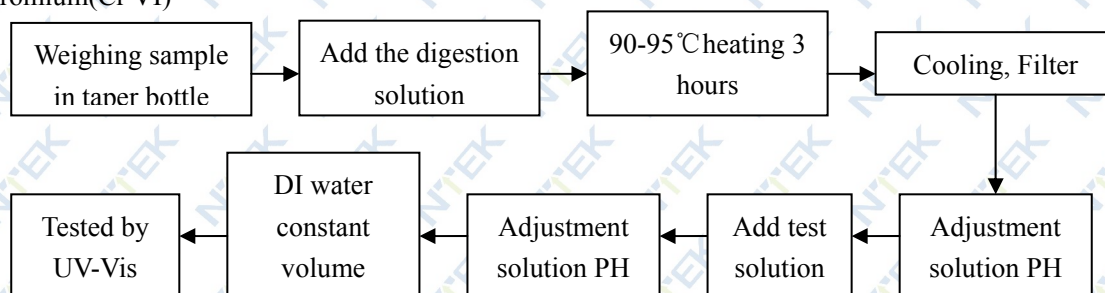
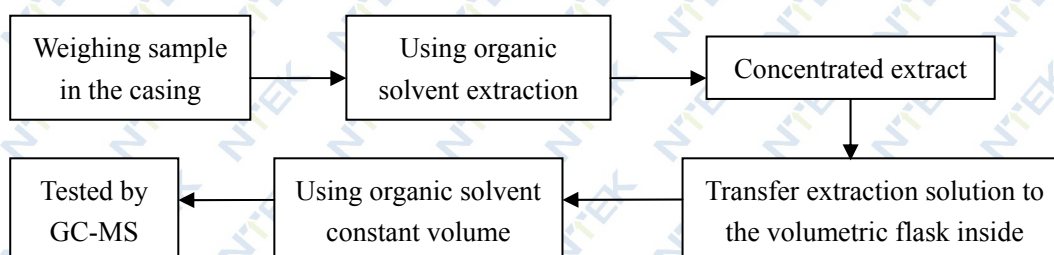
-X= The symbol "X" marks the region where further investigation is necessary.

-3  $\sigma$  = The reproducibility of analytical instruments

-LOD= Detection limit

#### 2. Chemical Test

Testing item	Pretreatment method	Measuring instrument	MDL
Lead(Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES	2 mg/kg
Cadmium(Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES	2 mg/kg
Mercury(Hg)	IEC 62321-4:2013 Ed.1.0	ICP-OES	2 mg/kg
Chromium(Cr VI)	IEC 62321:2008 Ed.1	UV-Vis	2 mg/kg
PBBs/ PBDEs	IEC 62321:2008 Ed.1 Annex A	GC-MS	5 mg/kg

**Test Flow:**
**1. Lead(Pb), Cadmium(Cd)**

**2. Mercury (Hg)**

**3. Chromium(Cr VI)**

**4. PBBs/ PBDEs**


Sample photo:

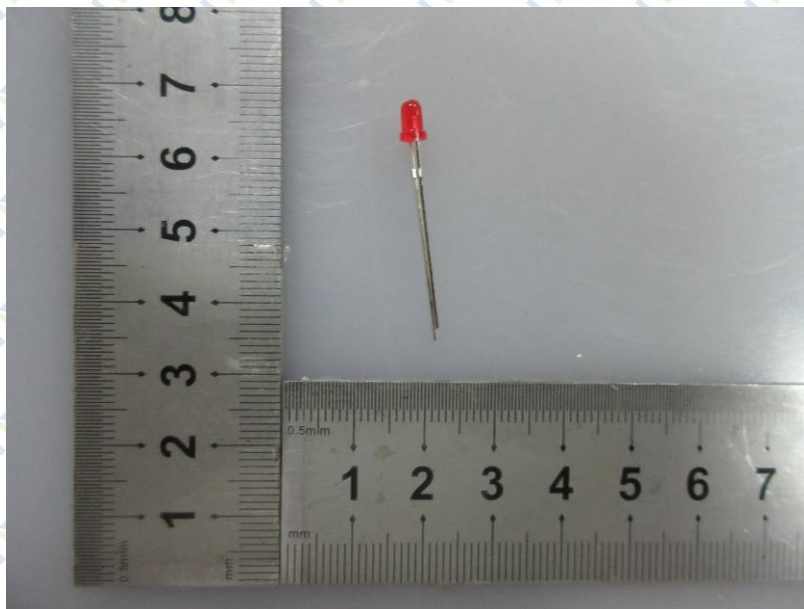


Fig.1

\*\*\*\*End of Report\*\*\*\*

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