



**CENTRE OF TESTING SERVICE  
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

# **TEST REPORT**

**RoHS 2011/65/EU**

Test Report Number : CNB3121105-03304-C



CTS (Ningbo) Testing Service Technology Co., Ltd.

Fl.2 South Huoju Building, No.181 Canghai Rd., Jiangdong High-tech Park, Ningbo China

PHONE +86-574-87912121 FAX +86-574-87907993

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**CTS (Ningbo) Testing Service Technology Co., Ltd.**  
F12 south Huoju Building, No 181 canghai Rd., Jiangdong High-tech Park Ningbo China  
Tel: +86-574-87912121 (16 lines) Fax: +86-574-87907993  
Complaint line: +86-574-87908003 E-mail: cts@cts-lab.com

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### 1 General Information

#### 1.1 Application Details

Name :  
Address :  
Contact :  
Telephone :  
Fax :  
Mobile telephone :  
Email :

#### 1.2 Manufacturer & Buyer

Manufacturer name :  
Address :  
Contact :  
Telephone :  
Fax :  
Mobile telephone :  
Email :  
Buyer name :

#### 1.3 Description of the Test Item

Sample name : LED FLASHLIGHT  
Model No. :  
Brand name :  
Condition of sample(s) : EFFECTIVE

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## 2 Test results

### 2.1 Sample Receiving Date

Nov. 6, 2012

### 2.2 Testing Period

Nov. 6, 2012 to Nov. 12, 2012

### 2.3 Text Requested

In accordance with the RoHS Directive 2011/65/EU Annex II.

### 2.4 Test Method

1. X-Ray Fluorescence Spectrometry method in reference to IEC 62321: 2008.
2. Chemical test method

Test Item(s)	Test Method	Test Instrument
Lead (Pb)	With reference to IEC 62321:2008	ICP-AES
Cadmium (Cd)	With reference to IEC 62321:2008	ICP-AES
Mercury (Hg)	With reference to IEC 62321:2008	ICP-AES
Chromium VI (Cr VI)	With reference to IEC 62321:2008	UV-Vis
PBBs	With reference to IEC 62321:2008	GC-MS
PBDEs		

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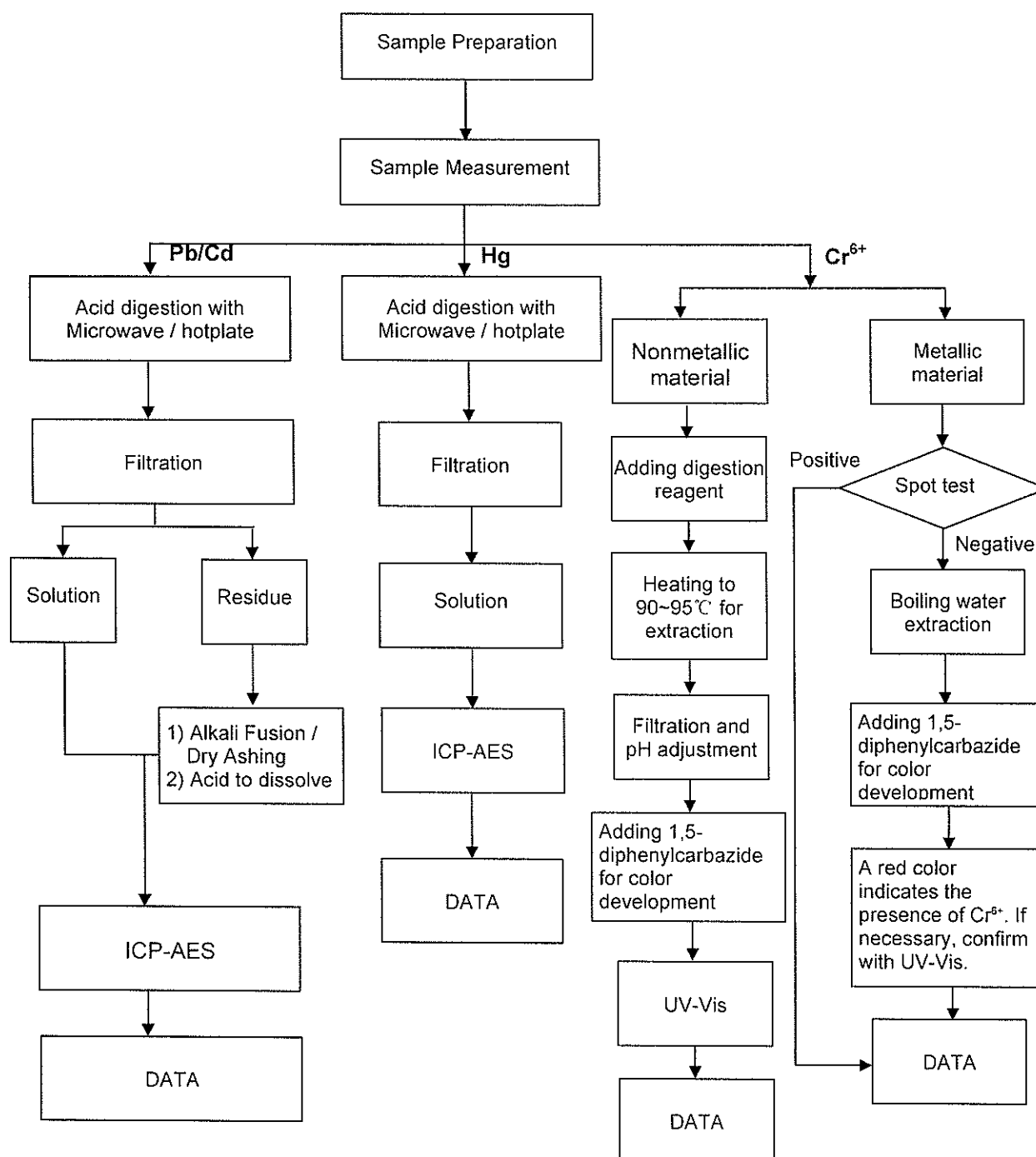
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### 2.5 Chemical Test Method Flow Chart



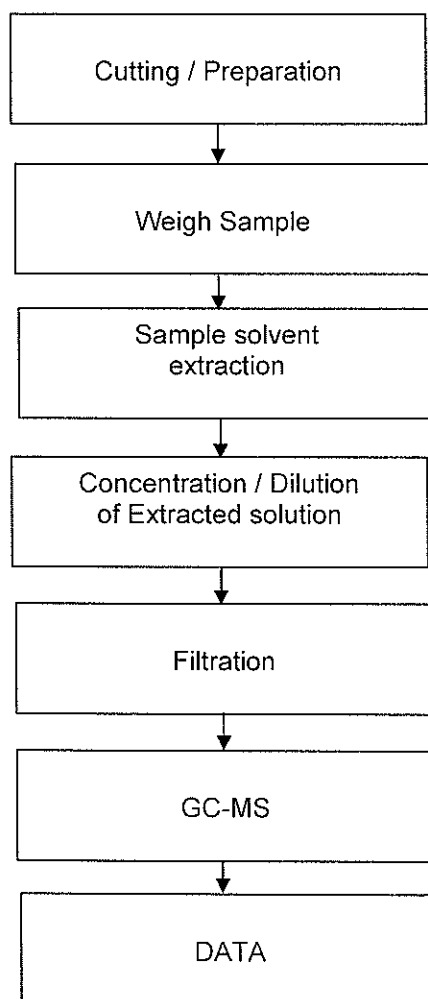
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### PBBs / PBDEs



## 2.6 Conclusion

Based on the performed tests on submitted samples, the results of Lead, Cadmium, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

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**2.7 Test Results****2.7.1 Test results of all parts by EDXRF and chemical confirmation**

No.	Sample Description		Results					Chemical Confirmation Result (Unit=mg/kg)
			Pb	Cd	Hg	Cr	Br	
1	Black rope		P	P	P	P	P	/
2	Silvery metal ring		P	P	P	P	/	/
3	Silver-white plating		P	P	P	P	P	/
4	Silvery metal shell		P	P	P	P	/	/
5	Bright silvery metal shell		P	P	P	P	/	/
6	Transparent plastic eyeglass		P	P	P	P	P	/
7	Black rubber button	Switch	P	P	P	P	P	/
8	Silvery metal spring		P	P	P	P	/	/
9	PCB	Copper foil	P	P	P	P	/	/
10		Base material	P	P	P	P	P	/
11	LED	Transparent body	P	P	P	P	P	/
12	Switch	Beige plastic	P	P	P	P	P	/
13		Black plastic	P	P	P	P	P	/
14		Spring(nigrescence)	P	P	P	P	/	/
15		Metal dome	P	P	P	P	/	/
16		Silvery metal contact piece	P	P	P	P	/	/
17	Silver-white metal spring		P	P	P	P	/	/

The measurement results only apply to the submitted samples

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Note : P = Below Limit (Pass)  
 F = Over Limit (Fail)  
 X = Inconclusive  
 N.D. = not detected (less than MDL)  
 1mg/kg=1ppm=0.0001%  
 Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;  
 (The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed)  
 Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area.

### Remarks:

- (1) Results are obtained by EDXRF for primary screening, and further chemical testing is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321: 2008.

Element	Polymer Materials	Metallic Materials	Electronic Materials
Pb	P ≤ 500 < X < 1300 ≤ F	P ≤ 500 < X < 1300 ≤ F	P ≤ 500 < X < 1300 ≤ F
Cd	P ≤ 50 < X < 130 ≤ F	P ≤ 50 < X < 130 ≤ F	X < 130 ≤ F
Hg	P ≤ 500 < X < 1300 ≤ F	P ≤ 500 < X < 1300 ≤ F	P ≤ 500 < X < 1300 ≤ F
Cr	P ≤ 700 < X	P ≤ 700 < X	P ≤ 500 < X
Br	P ≤ 250 < X	/	P ≤ 250 < X

### (2) Chemical Confirmation Result acceptable Limit:

Test items	Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Chromium (CrVI)	PBBs	PBDEs
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Acceptable Limit	1000	100	1000	1000	1000	1000

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### 2.7.2 Test results by chemical analysis

Test items		Lead (Pb)	Cadmium (Cd)	Mercury (Hg)	Chromium (CrVI)	PBBs	PBDEs
Unit		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Acceptable Limit		1000	100	1000	1000	1000	1000
18	Silvery metal rope buckle	203	N.D.	N.D.	Negative	N.A.	N.A.
19	Silvery coating On reflector	28	N.D.	N.D.	N.D.	N.D.	N.D.
20	Black plastic reflector	41	N.D.	N.D.	N.D.	N.D.	N.D.
21	Soldering tin and solder	58	N.D.	N.D.	Negative	N.A.	N.A.
22	LED Pin	860	N.D.	N.D.	Negative	N.A.	N.A.
23	Black plastic cell box	74	N.D.	N.D.	N.D.	N.D.	N.D.

Note

1. Specimens, which requested to determine Cadmium, Mercury and Lead content, have been dissolved completely.
2. N.D. = not detected (less than MDL)
3. N.A. = not applicable
4. 1 mg/kg=1 ppm=0.0001%
5. **Spot –test:**  
 Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;  
 (The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed)  
**Boiling-water-extraction:**  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area.
6. **Positive** indicates the presence of CrVI on the tested areas and result be regarded as conflict with RoHS requirement.  
**Negative** indicates the absence of CrVI on the tested areas and result be regarded as no conflict with RoHS requirement.

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7. The method detect limit for each hazardous substances, and determined individual PBBs and individual PBDEs are:

Method Detect Limit in mg/kg		
Heavy Metals	Lead (Pb)	2
	Cadmium (Cd)	2
	Mercury (Hg)	2
	Chromium (CrVI)	2
PBBs	Monobromobiphenyl	5
	Dibromobiphenyl	5
	Tibromobiphenyl	5
	Tetrabromobiphenyl	5
	Pentabromobiphenyl	5
	Hexabromobiphenyl	5
	Heptabromobiphenyl	5
	Octabromobiphenyl	5
	Nonabromodiphenyl	5
	Decabromodiphenyl	5
PBDEs	Monobromodiphenyl ether	5
	Dibromodiphenyl ether	5
	Tibromodiphenyl ether	5
	Tetrabromodiphenyl ether	5
	Pentabromodiphenyl ether	5
	Hexabromodiphenyl ether	5
	Heptabromodiphenyl ether	5
	Octabromodiphenyl ether	5
	Nonabromodiphenyl ether	5
	Decabromodiphenyl ether	5

Written by: *Jessie*

Inspected by: *Jessie*

Approved by: *Jan* 

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

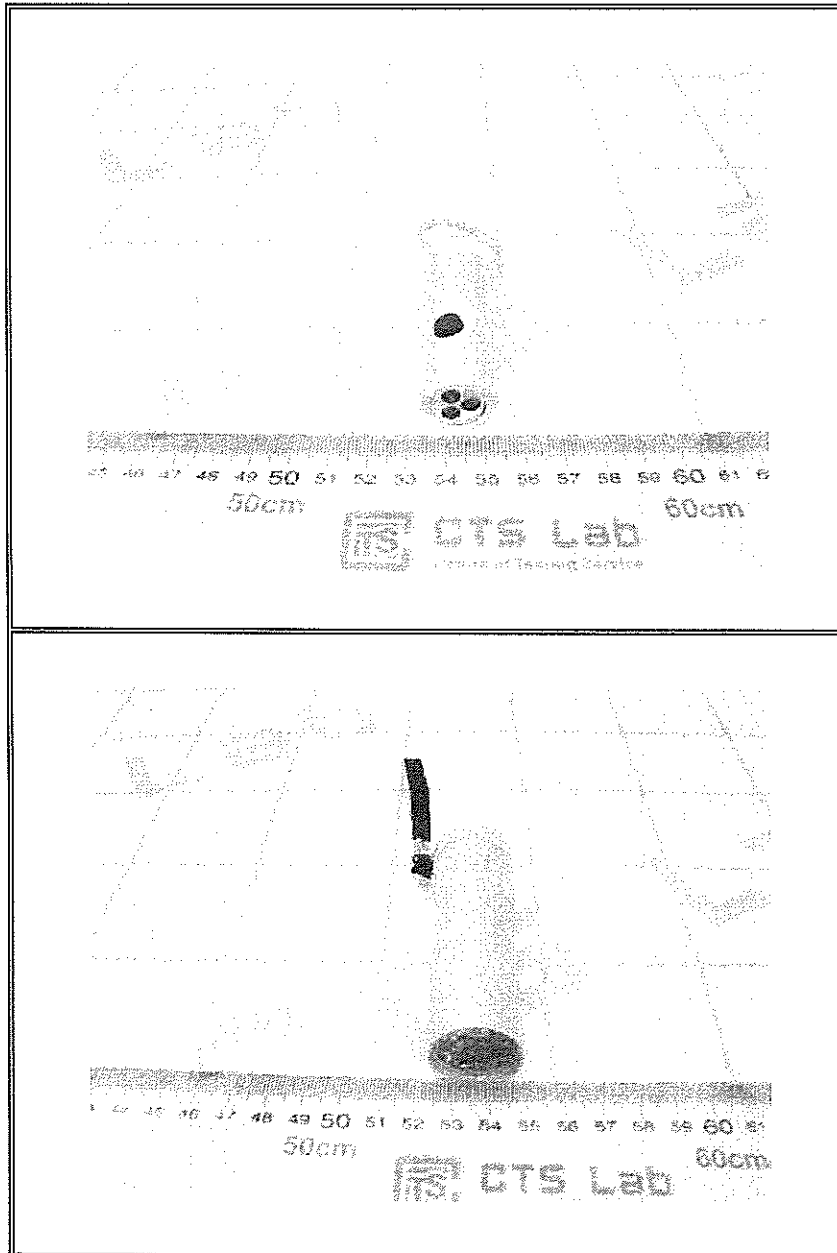
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**3 Sample Reference Photo**



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