TEST REPORT

Customer:

Address:

Report on the submitted sample said to be

Sample name: LED strobe arm band

Model: UF5190（U289）、UF5185

Item/Lot No.: /

Material: /

Buyer: /

Supplier: /

Manufacturer: /

Sample received date: Jan. 02, 2014

Testing period: From Jan. 02, 2014 to Jan. 07, 2014

Testing method:

With reference to IEC 62321:2008

(1) Section 6: Screening by X-ray Fluorescence Spectrometry (XRF)

(2) Chemical test:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321:2008, section 8/9/10	ICP-OES	2 mg/kg
Cadmium (Cd)	IEC 62321:2008, section 8/9/10	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321:2008, section 7	CV-AAS	2 mg/kg
Chromium (Cr Ⅵ)	IEC 62321:2008, section C/B	UV-VIS	2 mg/kg 0.02 mg/kg*
PBBs/ PBDEs	IEC 62321: 2008, Annex A	GC-MS	5 mg/kg

Note:

- *0.02 mg/kg refers to the MQL of sample extraction liquid.

Result:

Please refer to the next page(s)

Standard	Result
Screening by XRF spectroscopy and chemical confirmation test for RoHS directive (2011/65/EU)	PASS

******FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)******

Signed for and on behalf of

Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader: Maggie	Reviewed by: Weikin	Approved by: Mickey
Li Tingting, Maggie	Wang Wexin, Weikin	Yuan Qi, Mickey
Chemical Test Director	Technical Director	Lab Manager

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Test Results:

No.	Component name	XRF results (mg/kg)		Chemical confirmation result (mg/kg)
1	Black plastic	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
2	Transparent plastic	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
3	Red switch button	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
4	Screw	Pb	N.D.	Cr: N.D.
		Cd	N.D.	
		Hg	N.D.	
		Cr	#2	
		Br	N.D.	
5	Elastic	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
6	White cloth	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	

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No.	Component name	XRF results (mg/kg)		Chemical confirmation result (mg/kg)
7	Velcro buckle	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
8	Velcro fabric	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
9	Copper	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
10	Circuit boards	Pb	N.D.	PBBs: N.D. PBDEs: N.D.
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	#2	
11	Spring	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
12	LED	Pb	N.D.	PBBs: N.D. PBDEs: N.D.
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	#2	

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No.	Component name	XRF results (mg/kg)		Chemical confirmation result (mg/kg)
13	Gold wire	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
14	Red wire	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
15	White wire	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
16	Contacts	Pb	N.D.	Cr: N.D.
		Cd	N.D.	
		Hg	N.D.	
		Cr	#2	
		Br	N.D.	
17	Chip resistors	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
18	White package IC	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	

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No.	Component name	XRF results (mg/kg)		Chemical confirmation result (mg/kg)
19	Soldering tin	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
20	Green switch button	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
21	Grey plastic	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
22	White plastic	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
23	Black switch button	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	
24	Blue plasitc	Pb	N.D.	---
		Cd	N.D.	
		Hg	N.D.	
		Cr	N.D.	
		Br	N.D.	

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No.	Component name	XRF results (mg/kg)		Chemical confirmation result (mg/kg)
25	Button batteries	Pb	N.D.	Cr: N.D.
		Cd	N.D.	
		Hg	N.D.	
		Cr	#2	
		Br	N.D.	

Remark:

- Specimens, which requested to determine Cadmium, Mercury and Lead Content by chemical test, have been dissolved completely.
- N.D. = Not Detected
- N.A.= Not Applicable
- Negative=Absence of Cr(Ⅵ);
- Positive=Presence of Cr(Ⅵ);

(#1) = The screening result was found in the region of inconclusive (See Table A) and further chemical tests were suggested.

(#2) = Cr or Br were detected above the screening Limit (see table A) and further chemical tests were suggested.

OL= OVER LIMIT

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(A) XRF Screening Limit in mg/kg for regulated elements in various matrices.

Element	Polymer materials	Metallic materials	Composite materials
Pb	BL≤ (700 -3σ) < X < (1300 +3σ)≤OL	BL≤ (700 -3σ) < X < (1300 +3σ)≤OL	BL≤ (500 -3σ) < X < (1500 +3σ)≤OL
Cd	BL ≤(70 -3σ)< X <(130+3σ)≤OL	BL ≤(70 -3σ) < X < (70 +3σ)≤OL	LOD < X < (150 +3σ) ≤OL
Hg	BL≤ (700 -3σ) < X < (1300 +3σ)≤OL	BL≤ (700 -3σ) < X < (1300 +3σ)≤OL	BL≤ (500 -3σ) < X < (1500 +3σ)≤OL
Cr	BL ≤ (700-3σ)< X	BL ≤ (700-3σ)< X	BL ≤ (500-3σ)< X
Br	BL ≤(300-3σ)< X	Not Applicable	BL ≤(250 -3σ)< X

Remark:

- A “BELOW LIMIT” (BL) or “OVER LIMIT” (OL) determination will be set at 30 % (50 % for composite materials) less than or greater than the limit, respectively. The margins of safety have been agreed upon based on the experience of many experts and practitioners in the industry. Further explanation for this approach to estimating uncertainty.
- The symbol “X” marks the region, where further investigation is necessary.
- LOD means Limit of Detection.
- The term “3σ” expresses the repeatability of the analyzer at the action level.

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(B) XRF

Element	Unit	MQL
Pb	mg/kg	30
Cd	mg/kg	30
Hg	mg/kg	30
Cr	mg/kg	30
Br	mg/kg	30

(C) RoHS Requirement

Restricted substances	Limits
Lead (Pb)	0.1% (1000 mg/kg)
Cadmium (Cd)	0.01% (100 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium(Ⅵ) (Cr^{6+})	0.1% (1000 mg/kg)
Polybrominated biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated diphenyl ethers (PBDEs)	0.1% (1000 mg/kg)

The above limits were quoted from 2011/65/EU.

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Remark:

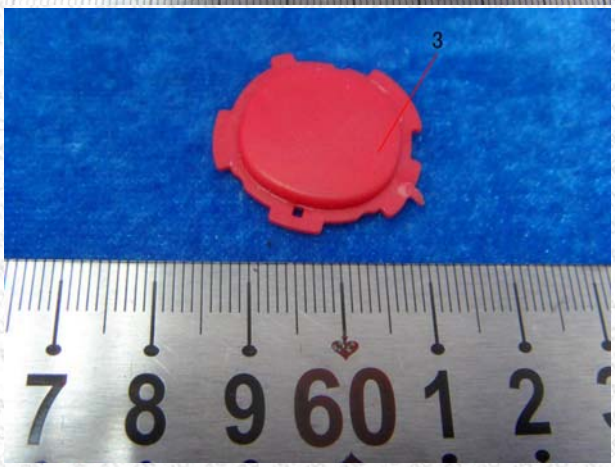
- Chemical confirmation tests were conducted to verify the inconclusive results, Chromium(Cr Ⅵ), Polybrominated biphenyls(PBBs) and Polybrominated diphenyl ethers(PBDEs) content.
- As requested by the applicant, only components shown in this report were by XRF spectroscopy for 2011/65/EU, other substances were not screened in this report.

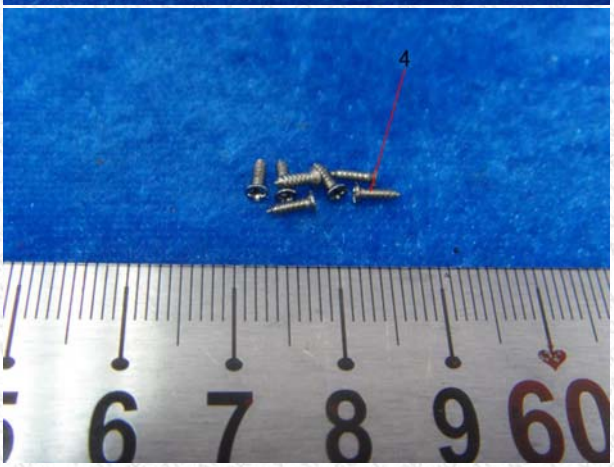
Disclaimers:

- This XRF Screening Report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF Screening Report is sufficient for its/his/her purposes.
- The results shown in this XRF Screening Report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. Plastic, Rubber, Metal, Glass, Ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

TEST REPORT

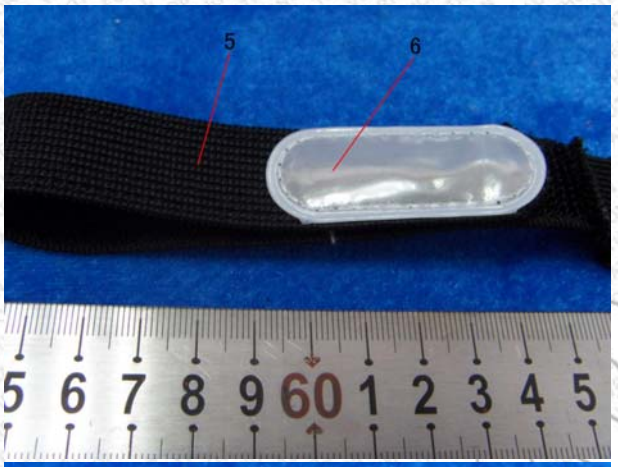
Photographs of Samples

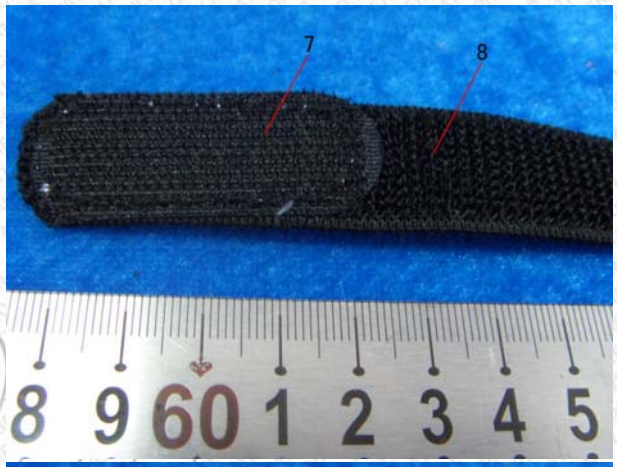


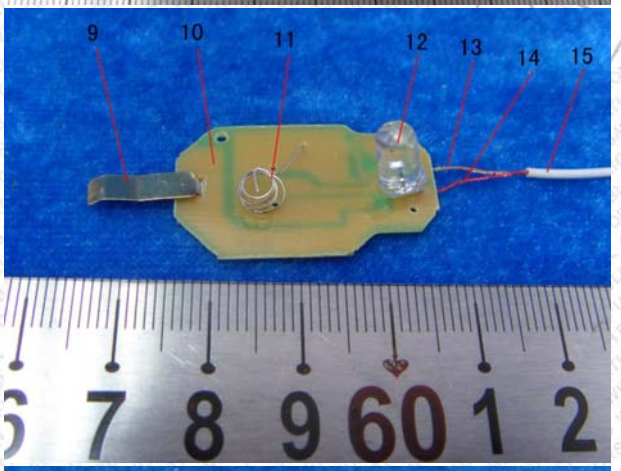


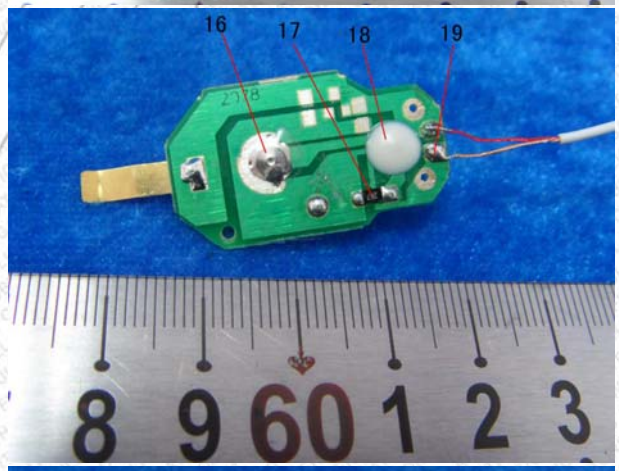
TEST REPORT

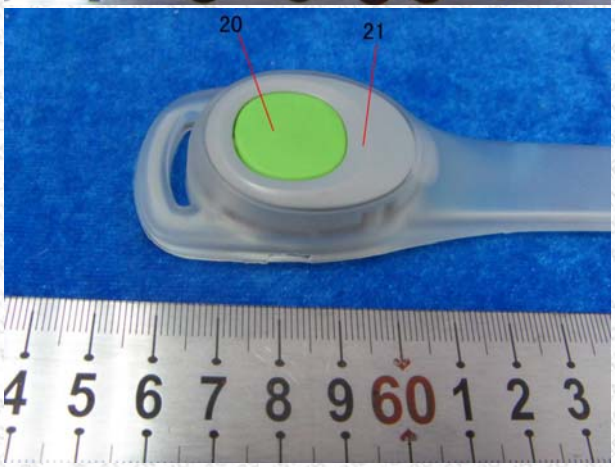
Photographs of Samples





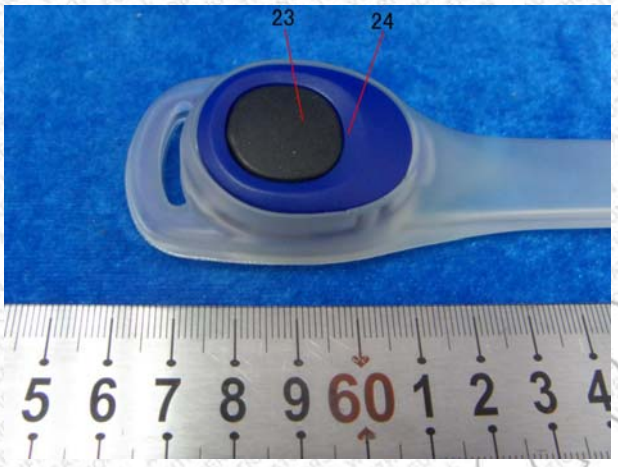


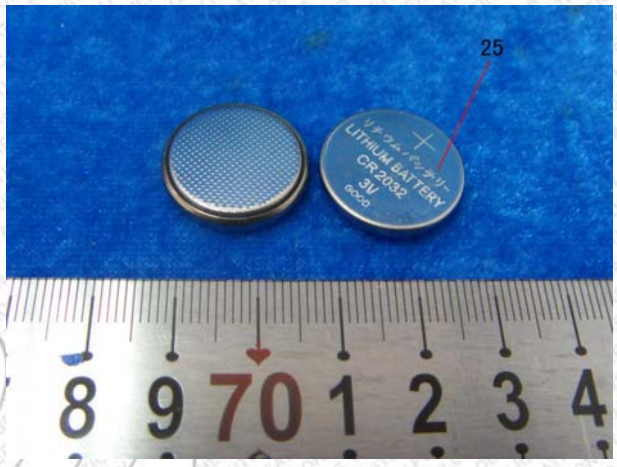




TEST REPORT

Photographs of Samples





End of Report