



Test Report

Report No : TST2019082330-3RR

Date: Aug. 30, 2019

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Applicant :

Address :

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

Sample Name : TWS Earphone

Main Model : UTW-1003P

Sample Received Date : Aug. 23, 2019

Testing Period : Aug. 23, 2019 To Aug. 30, 2019

Test Requested

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 wet chemical methods are required to test Lead(Pb),Cadmium(Cd),Mercury(Hg),Hexavalent Chromium(Cr(VI)),Polybrominated Biphenyls(PBBs),Polybrominated Diphenyl Ethers(PBDEs),Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutylphthalate (DBP) , and Diisobutyl phthalate (DIBP) in the submitted sample(s).

Test Method : Please refer to next page(s).

Test Result : Please refer to next page(s).

Conclusion : The test results comply with the limits of RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of



Andy Zheng
Technical Director

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
1	PCB	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	X	N.D.	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
2	IC	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
3	Triple tube	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
4	Resistance	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
5	Capacitance	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
6	Inductance	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
7	Solder	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
8	Black electrolytic capacitor film	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
9	Black rubber	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
10	Pin	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
11	Aluminum shell	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
12	Electrolytic paper	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
13	Inductor body	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
14	Copper wire	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
15	Adhesive tape	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
16	Black wire	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
17	Black plastic shell	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
18	Wire core	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
19	Screw	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	X	N.D.	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
20	LED	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
21	Black plastic tie	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP \DEHP\DIBP)	--	N.D.	
22	USB	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP \DEHP\DIBP)	--	N.D.	
23	Micro USB	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP \DEHP\DIBP)	--	N.D.	
24	Black plastic wire	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP \DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
25	Grey plastic	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
26	Gold metal contacts	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	
27	Black rubber	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
28	Magnet	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	

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No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
29	Suona	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	BL	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	N.D.	
30	Metal-back	Pb	BL	--	Pass
		Cd	BL	--	
		Hg	BL	--	
		Cr(Cr(VI))	BL	--	
		Br(PBBs&PBDEs)	--	--	
		Phthalate(DBP\BBP\DEHP\DIBP)	--	--	

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TST Testing Technology Co., Ltd.
信准检测技术服务(东莞)有限公司

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1. It is the result on total Br while test item on restricted substances in PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

2. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC62321:2013 Ed.1 Sec.6 & Annex D.

Element	Polymer Material	Metallic Material	Composite Material
Pb	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma \leq X < 1500 + 3\sigma \leq OL$
Cd	$BL \leq 70 - 3\sigma \leq X < 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma \leq X < 130 + 3\sigma \leq OL$	$LOD < X < 150 + 3\sigma \leq OL$
Hg	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma \leq X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma \leq X < 1500 + 3\sigma \leq OL$
Cr	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$

XRF detection limits in mg/kg for regulated elements in various material

Element	Polymer Material	Metallic Material	Composite Material
Pb	10	50	50
Cd	10	50	50
Hg	10	50	50
Cr	10	50	50
Br	10	50	50

Note:

- BL = Under the XRF screening limit
- OL = Future chemical test will be conducted while result is above the screening limit
- X = The symbol "X" marks the region where further investigation is necessary
- 3σ = The reproducibility of analytical instruments
- LOD = Detection limit

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3. Wet chemical test

Test Item(s)	Test Method	Test Equipment	MDL
Pb	IEC62321-5:2013	ICP-AES	2
Cd	IEC62321-5:2013	ICP-AES	2
Hg	IEC62321-4:2013	ICP-AES	2
Cr(VI)	IEC62321-7-1:2015 IEC62321-7-2:2017	UV-Vis	2
PBB	IEC62321-6:2015	GC-MS	5
PBDE	IEC62321-6:2015	GC-MS	5
Dibutyl Phthalate(DBP)	IEC62321-8:2017	GC-MS	30
Benzylbutyl Phthalate (BBP)	IEC62321-8:2017	GC-MS	30
Di-(2-ethylhexyl) Phthalate(DEHP)	IEC62321-8:2017	GC-MS	30
Diisobutyl phthalate (DIBP)	IEC62321-8:2017	GC-MS	30

Note:

- mg/kg= ppm=0.0001%
- ND=Not Detected(<MDL)
- MDL = Method Detection Limit
- = No Testing
- Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm² sample surface
- *=According to 2011/65/EU Annex, point 6-Lead as an alloying element is steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight and as a copper alloy, containing up to 4% lead by weight can be exempted.

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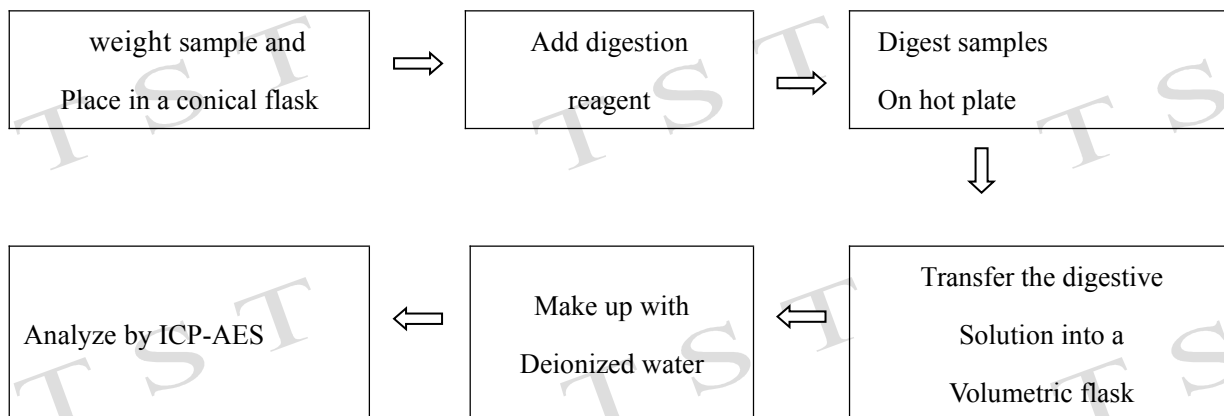
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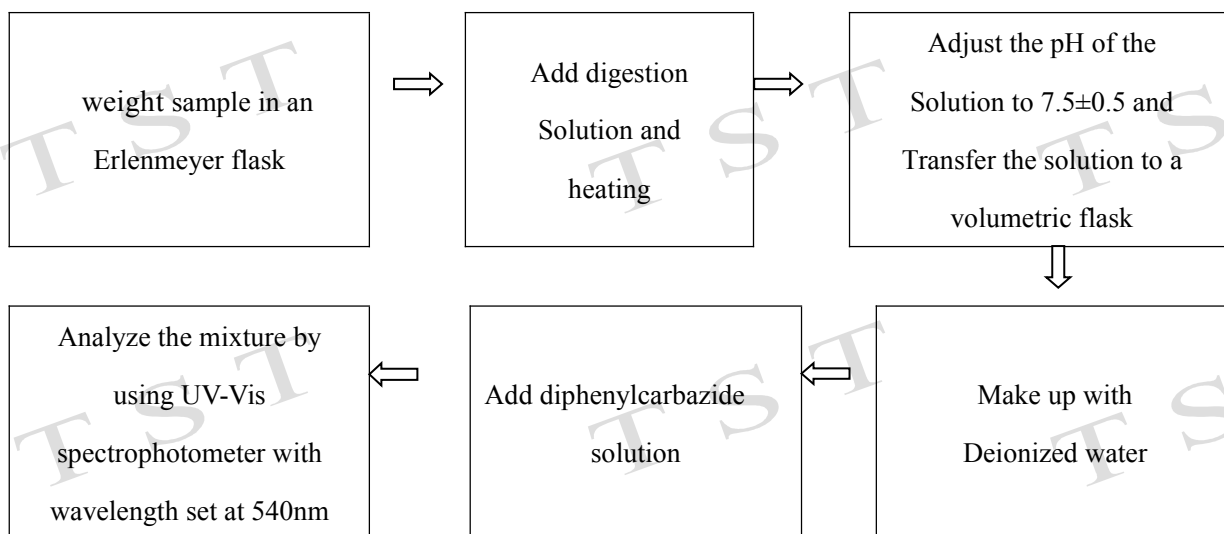
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Test Process:

1. Test for Cd/Pb Content



2. Test for Chromium(VI) Content



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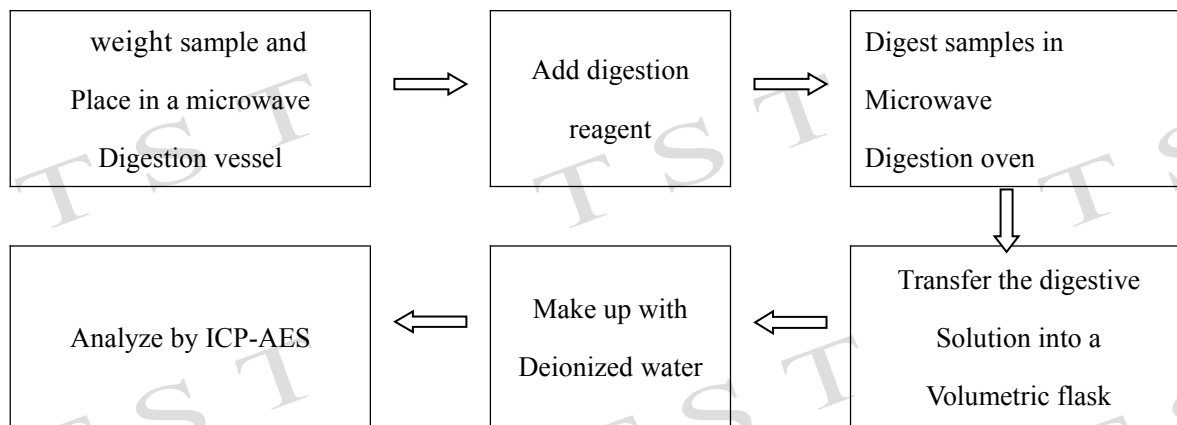
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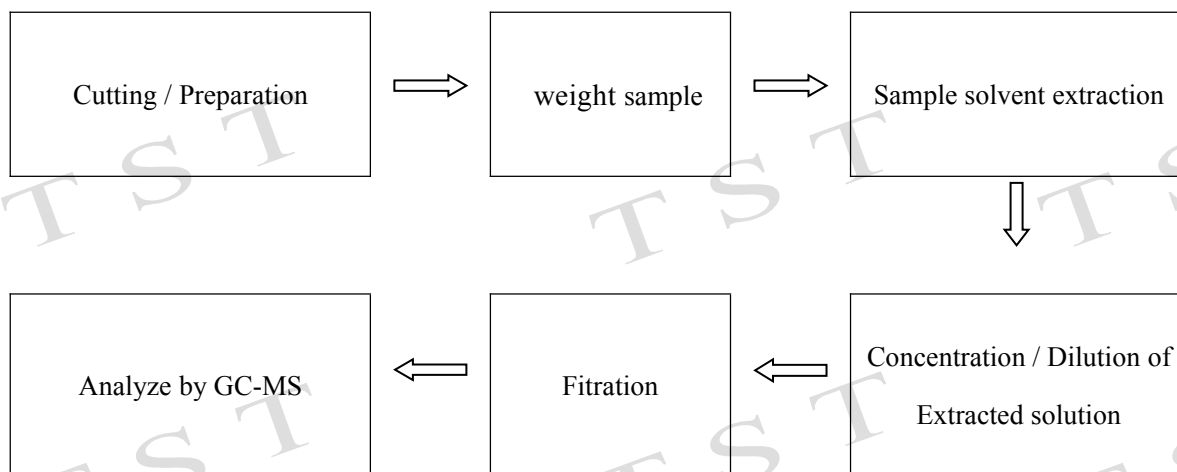
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3. Test for Hg Contents



4. Test for PBBs/PBDES/DBP/BBP/DEHP/DIBP



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Sample photo:



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