TEST REPORT

No. QA00005

Determine the Pb, Cd, Hg, Cr(VI), PBBs , PBDEs, DEHP, BBP, DBP&DIBP content of the sample,performed in accordance with RoHS Directive 2011/65/EU(RoHS 2.0) and its subsequent amendments Directive (EU) 2015/863

PRODUCT	Leakage circuit breaker,
MODEL(s) TESTED	JX266361, JX344061
TRADE MARK	ETTROIT
APPLICANT	Wenzhou Yijie Electric Co., Ltd. No. 83, Fengquan Road, Tianhe street, Wenzhou Economic and Technological Development Zone, WeZhou City, Zhejiang Province

Tested by	Engineer	Kevin Chen
Reviewed by	Laboratory Manager	Leo Qin
Approved by	Technical Manager	Alger Shi

Revision Sheet

Release No.	Date	Revision Description
Rev. 01	2024-01-31	First edition: test report nr. QA00005

The results of tests and checks reported in this Test Report refer exclusively to the samples tested and described in the Report itself.
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GENERAL DATA

SAMPLE		
Samples received on	2024-01-16	**Item(s) sampled and sent by applicant**
Reference samples	See model list in ANNEX 1	
Samples tested No.	001 & 002	

TESTING LOCATION	
Testing dates	2024-01-16~2024-01-31
Testing laboratory	IMQ Certification (Shanghai) Co., Ltd. Unit A401, No.258 Yangzhai Road Changning District, Shangha, 200050, P.R.China
Testing site	STQ Testing Services Co., Ltd. Building 1, 15 Yinzhu Road, High-new district, Suzhou, China 215129

TESTING INFORMATION	
Test Request	According to customer's requirements, Split the sample and determine the Pb, Cd, Hg, Cr(VI), PBBs, PBDEs, DEHP, BBP, DBP&DIBP content of the parts.
Test method	1. EN 62321-1:2013 Determination of certain substances in electrotechnical products - Part 1: Introduction and overview 2. EN 62321-2:2014 Determination of certain substances in electrotechnical products - Part 2: Disassembly, disjunction and mechanical sample preparation 3. EN 62321-3-1:2014 Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine using X-ray fluorescence spectrometry. 4. Wet Chemical Test Method a. Determination of Lead ,Cadmium by ICP-OES with reference to EN 62321-5:2014 b. Determination of Mercury by ICP-OES with reference to EN 62321-4:2014+A1:2017 c. Determination of Hexavalent Chromium by Spot test or UV-Vis Method with reference to EN 62321-7-2: 2017 d. Determination of PBBs and PBDEs by GC-MS with reference to EN 62321-6: 2015 e. Determination of Phthalates by GC-MS with reference to EN 62321-8:2017
Test Conclusion	Based on the analysis on the submitted samples, the test results **do comply with** the RoHS Directive 2011/65/EU(RoHS 2.0) and its subsequent amendments Directive (EU) 2015/863

ENVIRONMENTAL CONDITION	
Parameter	***Measured***
Ambient Temperature	20 ~ 25 °C
Relative Humidity	50 ~ 60 %
Atmospheric Pressure	900 ~1000 mbar

REFERENCE DOCUMENT

DOCUMENT		DATE	TITLE
☒	EN 62321	2009	Electrotechnical products - Determination of levels of six regulated substances
☒	EN 62321-1	2013	Determination of certain substances in electrotechnical products - Part 1: Introduction and overview
☒	EN 62321-2	2014	Determination of certain substances in electrotechnical products - Part 2: Disassembly, disjointment and mechanical sample preparation
☒	EN 62321-3-1	2014	Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry
☒	EN 62321-4	2014	Determination of certain substances in electrotechnical products - Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS
☒	EN 62321-5	2014	Determination of certain substances in electrotechnical products - Part 5: Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by AAS, AFS, ICP-OES and ICP-MS
☒	EN 62321-8	2017	Determination of certain substances in electrotechnical products - Part 8: Phthalates in polymers by gas chromatography-mass spectrometry (GC-MS), gas chromatography-mass spectrometry using a pyrolyzer/thermal desorption accessory (Py/TD-GC-MS)

EQUIPMENT UNDER TEST (EUT) DETAILS

MODEL (basic)	**Description**
JX266361, JX344061	Leakage circuit breaker
VARIANTS (derived)	**Description**
See model list in ANNEX 1	Leakage circuit breaker

MANUFACTURER	Wenzhou Yijie Electric Co., Ltd. No. 83, Fengquan Road, Tianhe street, Wenzhou Economic and Technological Development Zone, WeZhou City, Zhejiang Province
ASSEMBLY PLANT(s)	Wenzhou Yijie Electric Co., Ltd. No. 83, Fengquan Road, Tianhe street, Wenzhou Economic and Technological Development Zone, WeZhou City, Zhejiang Province

GENERAL PRODUCT INFORMATION:
THE PRODUCTS TESTED IN THIS REPORT ARE LEAKAGE CIRCUIT BREAKER

COPY OF MARKING PLATE:
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks. N.A.

SUMMARY OF TEST

POSSIBLE TEST CASE VERDICTS:	
Test object does meet the requirement	P(ass)/Comply
Test object does not meet the requirement	F(ail)/ /Not Comply
Test case does not apply to the test object	N.A.
Test object has not been checked	N.C.

GENERAL REMARKS:

Tests and check results, written here, refers only to tested object that are described in this report.
Only full reproductions of this Test Report are allowed without written authorization of IMQ Certification (Shanghai) Co., Ltd.

Throughout this report a point (coma) is used as the decimal separator.

Unless otherwise stated the uncertainties for the tests and measurements are evaluated in according to STQ Operational Instruction STQ-QP-5.4-01
The uncertainties evaluation has been carried out in accordance with IEC Guide 115 “Application of Uncertainty of measurement’s to Conformity Assessment Activity in the Electrotechnical Sector” and IECEE CTL decision sheet DSH 251x.

Internal Procedure STQ-QP-5.6-01 ensure that the requirements for traceability of calibrations, of all test equipment requiring calibration and calibration intervals are met.

The ability or reliability of this product to perform its intended function in a particular application has not been investigated.
Unless otherwise specified, warnings, installation instruction and/or user manual provided with the sample have been checked in English version only.
IMQ Certification (Shanghai) Co., Ltd. declines any responsibility derived from missing or wrong information provided aside by the applicant.

Manufacturer Wenzhou Yijie Electric Co., Ltd. declared that:
For all models of leakage circuit breaker listed in this report: all models are made by same materials only different in colors, sizes and appearances.
Since manufacturer is not able to provide samples of all models listed in this report, only selected model has been tested, but based on the guarantee letter provided by the manufacturer. IMQ Certification (Shanghai) Co., Ltd. takes no responsibility for any mistakes and the problems of products consistency caused by inaccurate and/or invalid information submitted by the applicant. The manufacturer will take the responsibility of all discrepancy and risk.

REQUIREMENTS AND TESTS

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
1#	Blue plastic strip (same with QA00004-2#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
2#	Blue plastic switch (same with QA00004-3#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
3#	Light grey plastic shell (same with QA00004-1#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
4#	Blue plastic button (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
5#	Silvery metal rivet (same with QA00004-5#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
6#	Light grey plastic part (same with QA00004-4#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
7#	Silvery metal screw (same with QA00004-11#)(JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
8#	Silvery metal part (same with QA00004-12#)(JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
9#	Silvery metal spring (同SZ2024010663-2 的9#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
10#	White plastic sheet (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
11#	Green plastic strip (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
12#	Silvery metal board (same with QA00004-27#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
13#	White plastic part (same with QA00004-22#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
14#	Coppery metal wire (same with QA00004-16#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
15#	Coppery metal contact sheet (same with QA00004-17#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
16#	Golden metal part (same with QA00004-24#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
17#	White plastic part (same with QA00004-23#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
18#	Silvery metal contact sheet (same with QA00004-13#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
19#	Silvery metal part (same with QA00004-8#)(JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
20#	Black plastic screw (same with QA00004-25#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
21#	Silvery metal contact sheet (same with QA00004-15#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
22#	Transparent rubber sheath(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
23#	Beige plastic frame (same with QA00004-20#)(JX266361)	XRF	BL	BL	BL	BL	IN		---	---	---	---
		CHEM	---	---	---	---	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
24#	Silvery metal spring (same with QA00004-19#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
25#	Grey plastic part (same with QA00004-10#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
26#	Silvery metal spring (same with QA00004-18#)(JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
27#	Silvery metal contact sheet (same with QA00004-21#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
28#	Silvery metal shaft (same with QA00004-7#)(JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
29#	Yellow wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
30#	Coppery metal sheet (JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
31#	Coppery metal coil (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
32#	Silvery metal contact point (same with QA00004-33#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
33#	Silvery metal cap (same with QA00004-30#)(JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
34#	Silvery metal spring (same with QA00004-29#)(JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
35#	White plastic part (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
36#	White plastic part(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
37#	Silvery metal spring (JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
38#	Green paper sheet (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
39#	Silvery metal contact sheet (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
40#	Black plastic shell (JX266361)	XRF	BL	BL	BL	BL	IN		---	---	---	---
		CHEM	---	---	---	---	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
41#	Yellow wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
42#	White wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
43#	Black solid glue (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
44#	Silvery metal sheet (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
45#	White plastic frame (same with QA00003-122#)(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
46#	Yellow wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
47#	Silvery metal wire (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
48#	Yellow plastic tape (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
49#	Coppery metal coil (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
50#	Silvery metal part (JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
51#	Silvery metal spring (JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
52#	Silvery metal rivet (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
53#	Silvery metal part (JX266361)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
54#	White paper tape (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
55#	Silvery metal solder tin (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
56#	Coppery metal spring (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
57#	Silvery metal sheet (same with QA00003-110#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
58#	White wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
59#	Black wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
60#	Red wire jacket (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
61#	Silvery metal solder tin (JX266361)	XRF	IN	BL	BL	BL	---		---	---	---	---
		CHEM	479	---	---	---	---	---	---	---	---	---
62#	Silvery metal contact sheet (JX266361)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
63#	Green varistor(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
64#	Black diode (JX266361) ①	XRF	IN	BL	BL	BL	IN		---	---	---	---
		CHEM	10680	---	---	---	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
65#	Black IC (JX266361) ①	XRF	IN	BL	BL	BL	IN		---	---	---	---
		CHEM	16520	---	---	---	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
66#	Blue resistor (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
67#	Black triode (JX266361)	XRF	IN	BL	BL	BL	IN		---	---	---	---
		CHEM	32	---	---	---	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
68#	Brown chip capacitor (JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
69#	Black IC(JX266361)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
70#	White foam ring (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
71#	Green PCB (JX266361)	XRF	BL	BL	BL	BL	IN		---	---	---	---
		CHEM	---	---	---	---	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
72#	Black chip resistor (JX266361) ①	XRF	IN	BL	BL	IN	BL		---	---	---	---
		CHEM	1473	---	---	N.D.	---	---	N.D.	N.D.	N.D.	N.D.
73#	White solid glue (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
74#	Silvery metal screw (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
75#	Black plastic part (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
76#	Red green plastic switch (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
77#	Black heat shrink tubing (same with QA00003-107#)(JX344061) ①	XRF	IN	BL	BL	BL	BL		---	---	---	---
		CHEM	2312	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
78#	Black diode (same with QA00003-108#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
79#	Yellow chip capacitor(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
80#	Silvery metal solder tin (JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
81#	Silvery metal part (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
82#	White transparent wire jacket (same with QA00003-153#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
83#	Pink resistor (same with QA00003-95#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
84#	Silvery metal pin (same with QA00003-96#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
85#	White transparent wire jacket (same with QA00003-153#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
86#	Beige plastic part (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
87#	Silvery metal shell (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
88#	White plastic frame (same with QA00003-122#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
89#	Yellow plastic part (same with QA00003-121#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
90#	Coppery metal coil (same with QA00003-123#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
91#	White plastic frame (same with QA00003-124#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
92#	Silvery metal frame (same with QA00003-125#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
93#	Silvery metal part (same with QA00003-126#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
94#	Golden metal rivet (same with QA00003-127#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
95#	Coppery metal part (same with QA00003-128#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
96#	Silvery metal spring (same with QA00003-129#)(JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
97#	Silvery metal contact sheet (same with QA00003-130#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

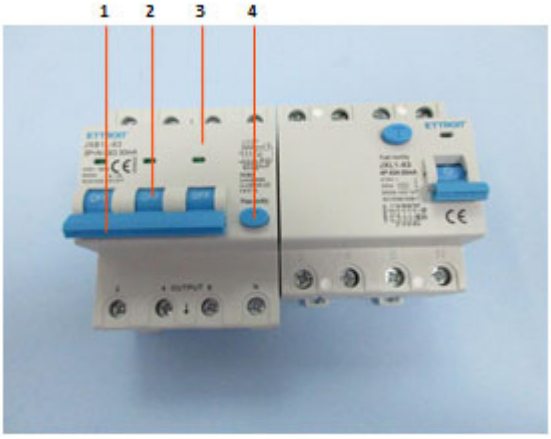
Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
98#	Silvery metal spring (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
99#	Silvery metal spring (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
100#	Silvery metal shaft (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
101#	Silvery metal plate (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
102#	Silvery metal part (JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
103#	Red plastic sheet (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
104#	Silvery metal board (same with QA00004-27#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---

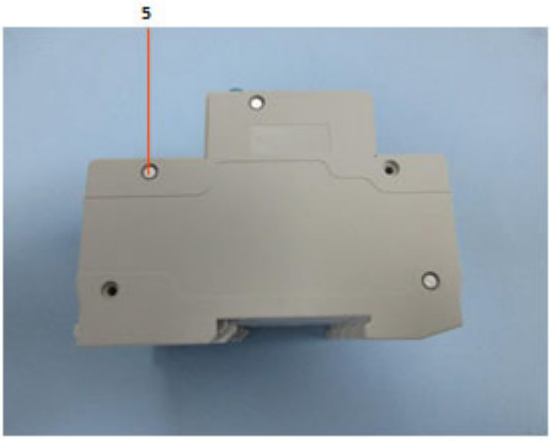
Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
105#	Silvery metal screw (same with QA00004-11#)(JX344061)	XRF	BL	BL	BL	IN	---		---	---	---	---
		CHEM	---	---	---	Neg.	---	---	---	---	---	---
106#	Silvery metal part (same with QA00004-12#)(JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
107#	Silvery metal contact sheet (JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
108#	Silvery metal contact point (JX344061)	XRF	BL	BL	BL	BL	---		---	---	---	---
		CHEM	---	---	---	---	---	---	---	---	---	---
109#	Beige plastic frame (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
110#	Green wire jacket (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
111#	Yellow wire jacket (JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

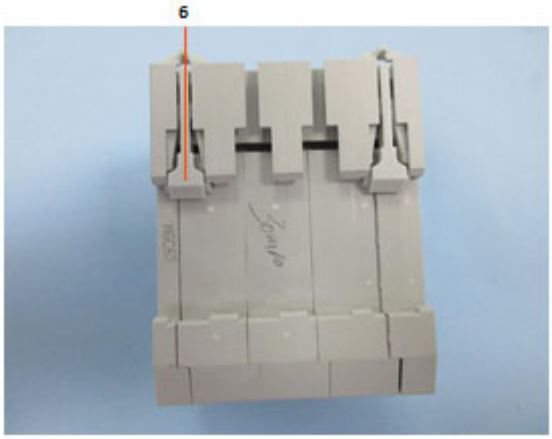
Part No.	Test Part Description	Note	Test Results (1)(2) (mg/kg)									
			Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	DEHP	BBP	DBP	DIBP
112#	Black plastic shell (same with QA00003-93#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
113#	Red transparent wire jacket (same with QA00003-98#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.
114#	Blue transparent wire jacket (same with QA00003-97#)(JX344061)	XRF	BL	BL	BL	BL	BL		---	---	---	---
		CHEM	---	---	---	---	---	---	N.D.	N.D.	N.D.	N.D.

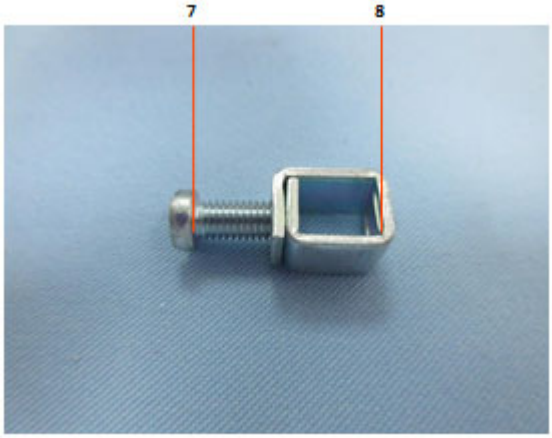
******** **To be continued** ********

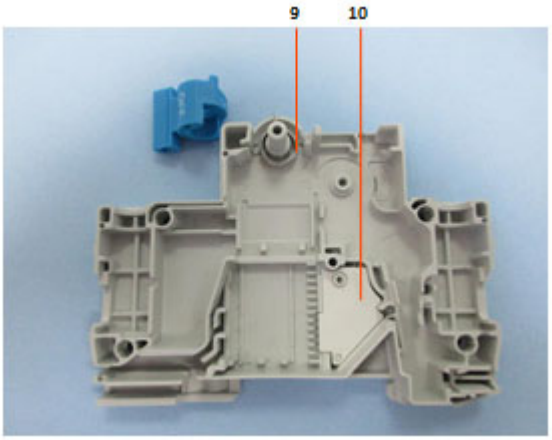
TEST PART PHOTOS

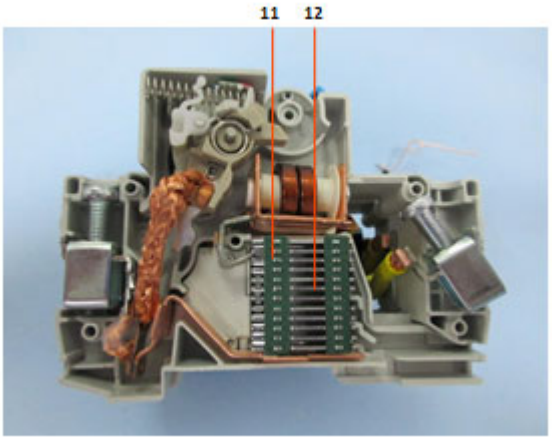


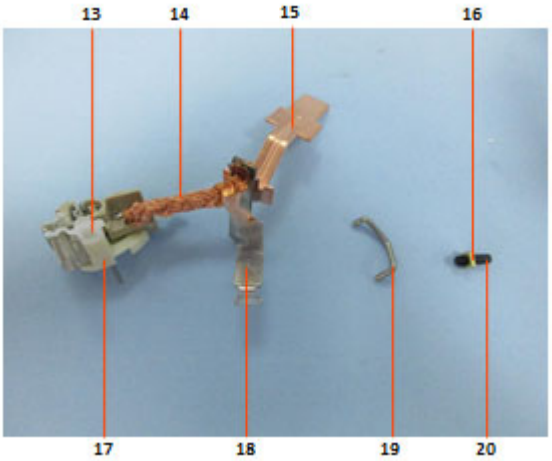








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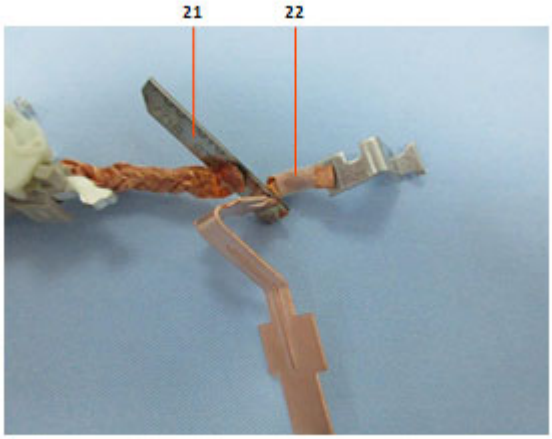
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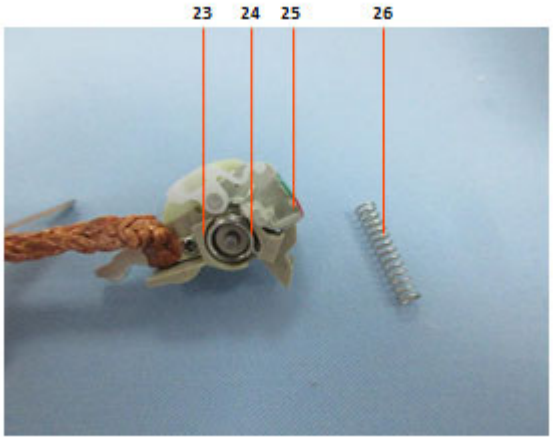
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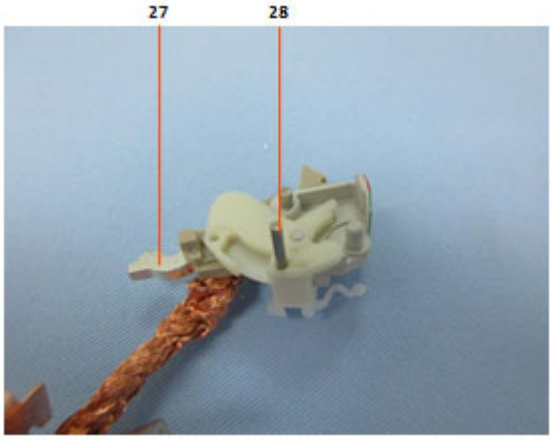
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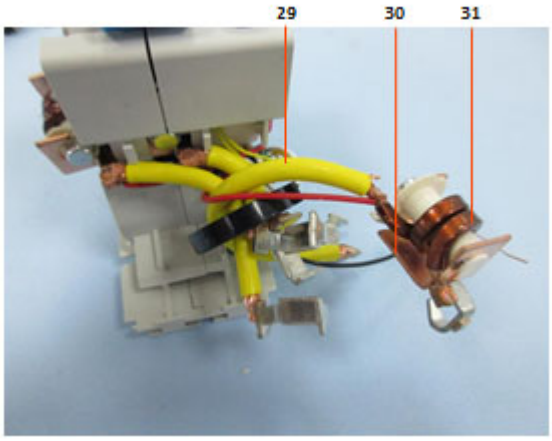
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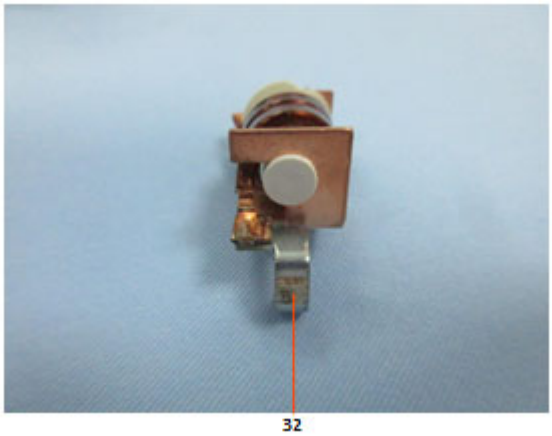
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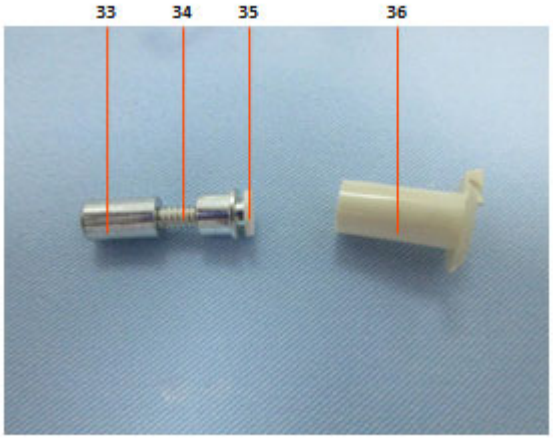
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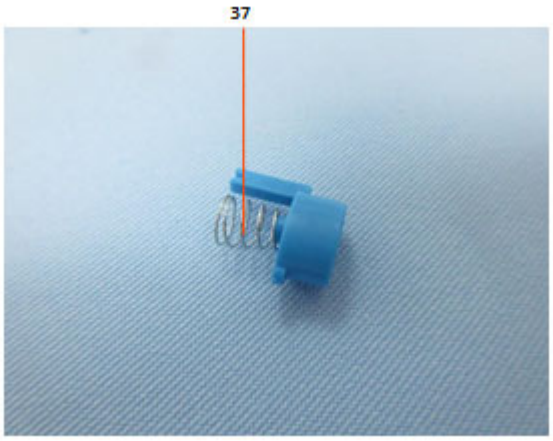
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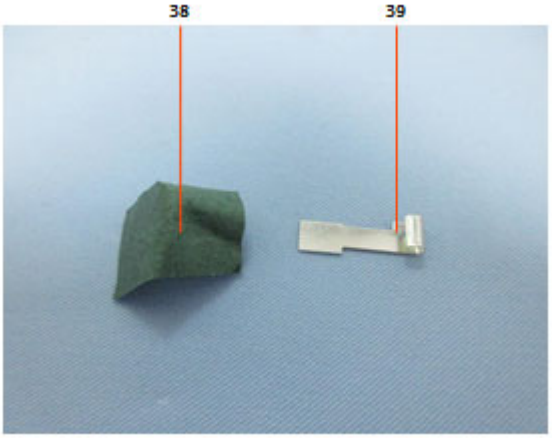
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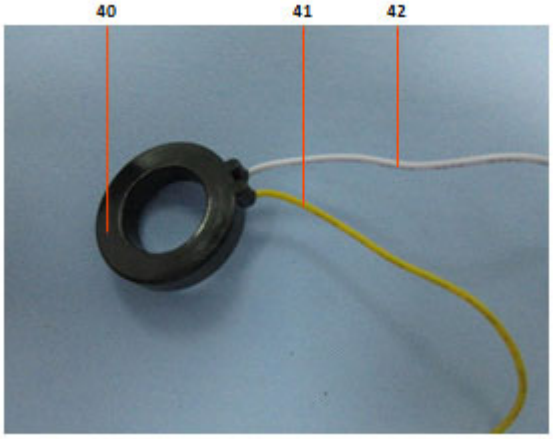
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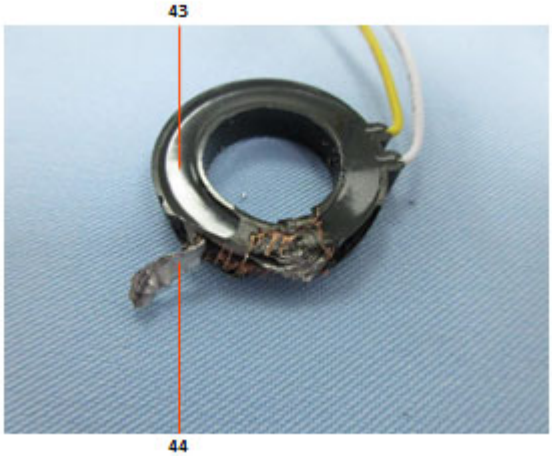
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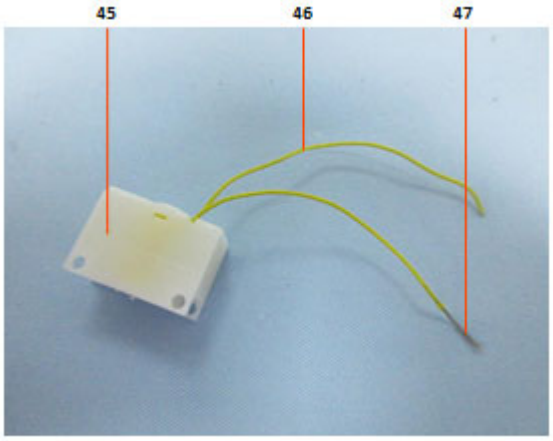
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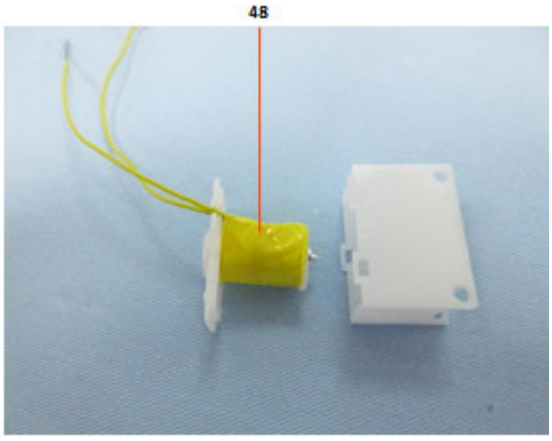
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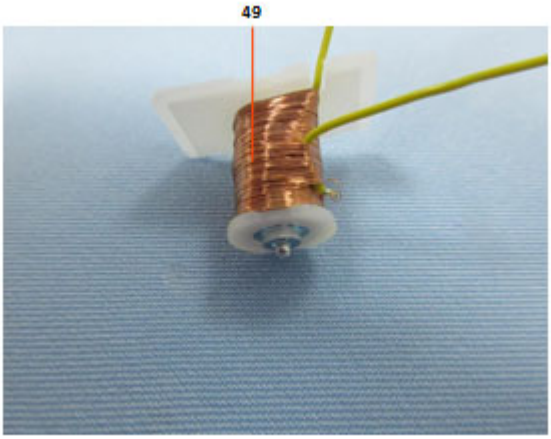
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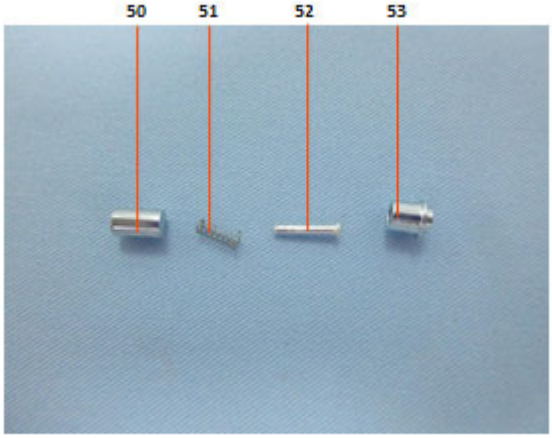
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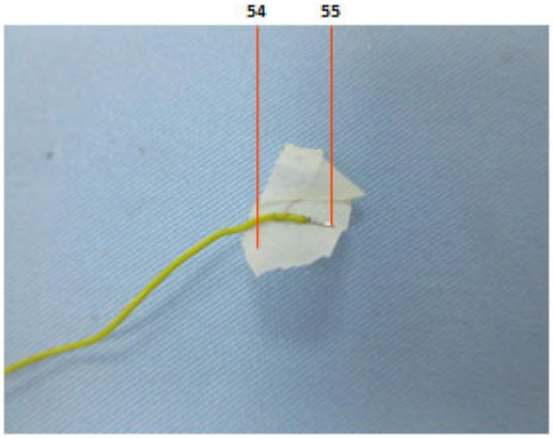
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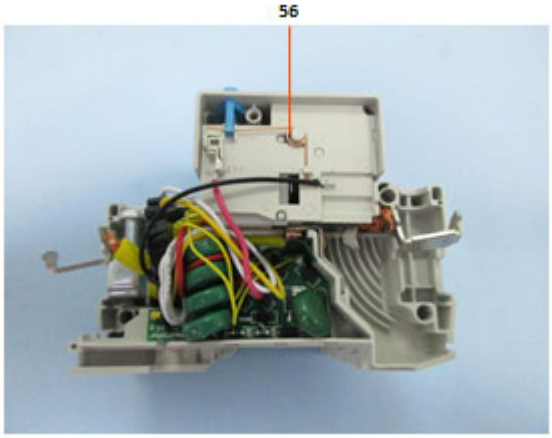
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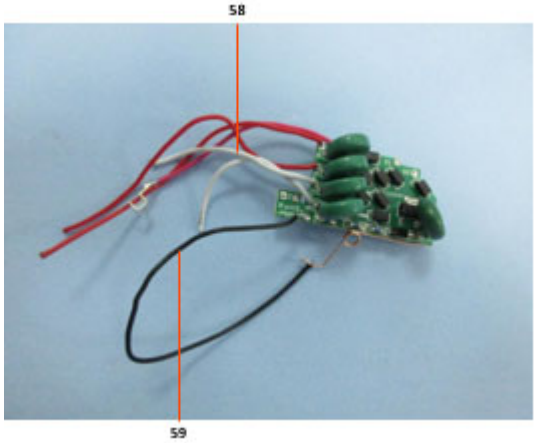
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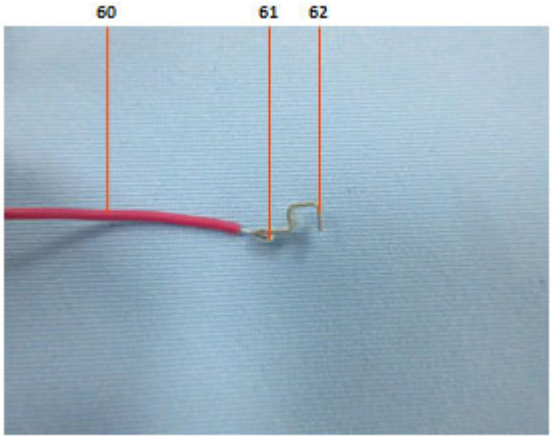
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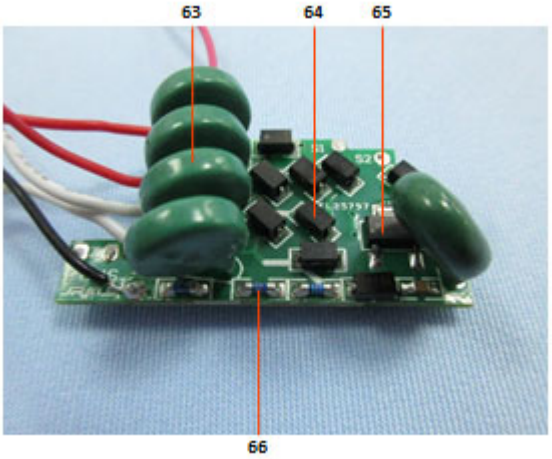
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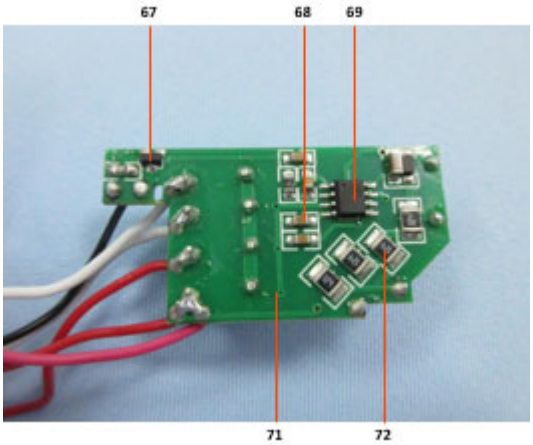
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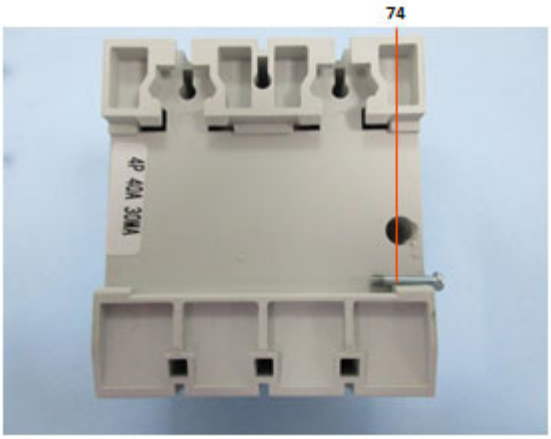
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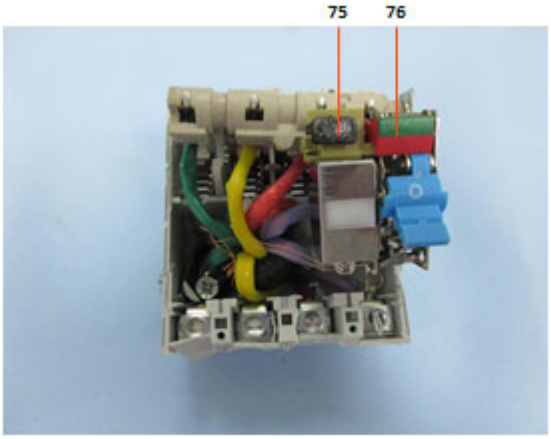
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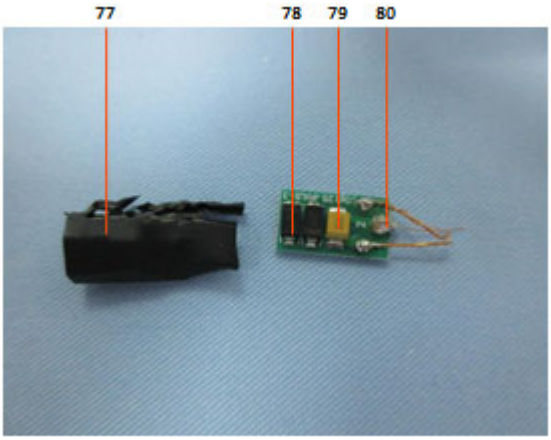
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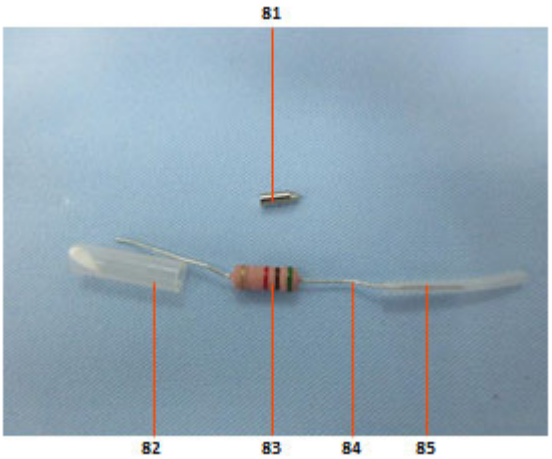
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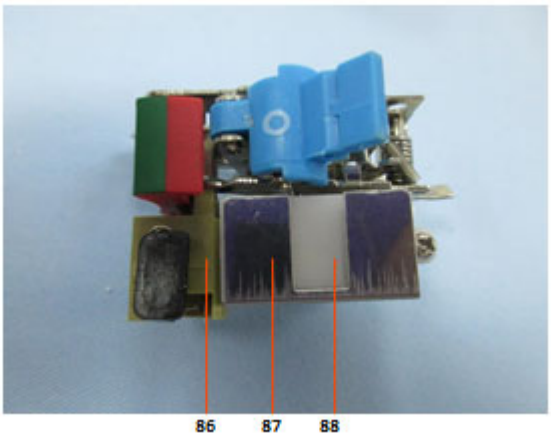
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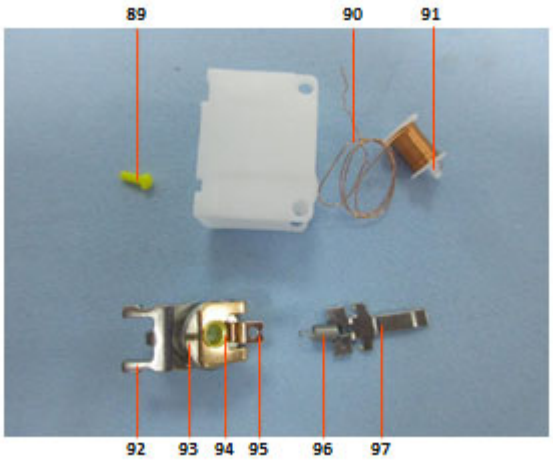
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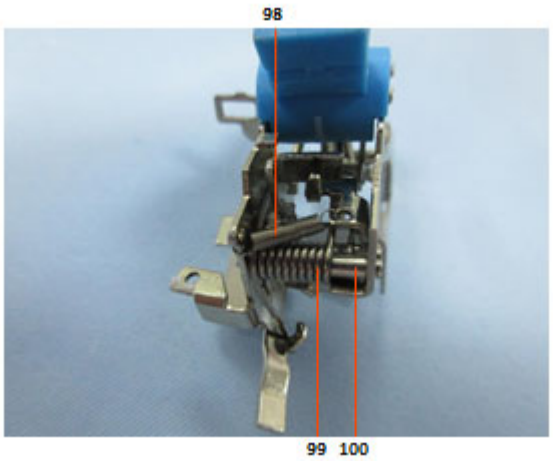

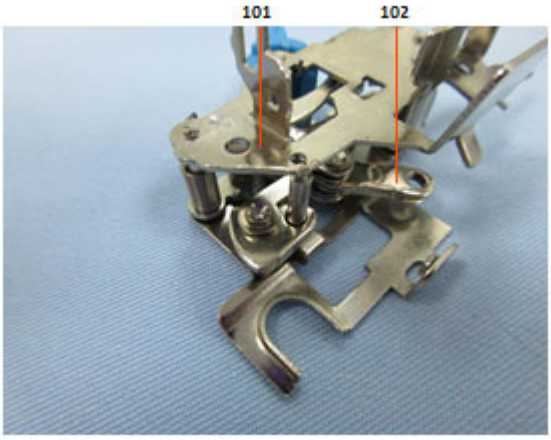

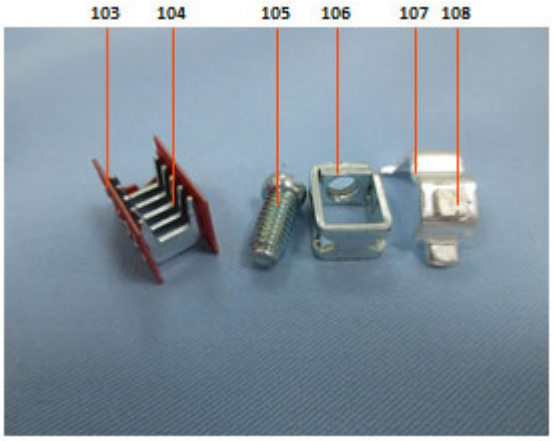

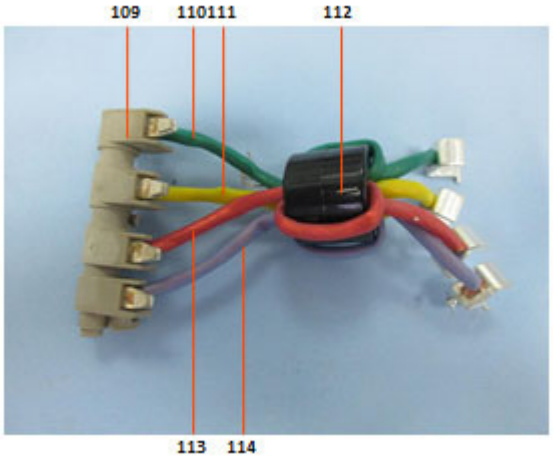

********** To be continued **********

Remark:

(1) For results of XRF

(a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr^{6+}.

(b)Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr^{6+}) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013 (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
Cd	BL≤(70-3σ)<X<(130+3σ) ≤OL	BL≤(70-3σ)<X<(130+3σ) ≤OL	LOD<X<(150+3σ) ≤OL
Pb	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(500-3σ)<X<(1500+3σ) ≤OL
Hg	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(500-3σ)<X<(1500+3σ) ≤OL
Br	BL≤(300-3σ)<X	--	BL≤(250-3σ)<X
Cr	BL≤(700-3σ)<X	BL≤(700-3σ)<X	BL≤(500-3σ)<X

(c) BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection,
-- = Not Regulated, NA = Not Applicable.

(d) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

(2) For results of Chemical testing

(a) mg/kg = ppm = 0.0001%, N.D..= Not Detected (<MDL), --- = Not Conducted.

(b) Unit and Method Detection Limit (MDL) in wet chemical test

Test Items	Pb	Cd	Hg	DEHP	BBP	DBP	DIBP
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	10	10	10	500	500	500	500

The MDL for single compound of PBBs & PBDEs is 10 mg/kg and MDL of Cr^{6+} for polymer &
composite sample is 10 mg/kg.

(c) According to IEC 62321-7-1:2015, result on Cr^{6+} for metal sample is shown as Pos./Neg.
Pos. =Positive, Neg. = Negative
Pos. = Presence of Cr^{6+} coating, Neg. = Absence of Cr^{6+} coating.

******** **To be continued** ********

(3)RoHS Requirement

Restricted substances	Limits
Lead (Pb)	0.1% (1000mg/kg)
Cadmium (Cd)	0.01% (100mg/kg)
Mercury (Hg)	0.1% (1000mg/kg)
Chromium (VI) (Cr6+)	0.1% (1000mg/kg)
Polybrominated biphenyls (PBBs)	0.1% (1000mg/kg)
Polybrominated diphenyl ethers (PBDEs)	0.1% (1000mg/kg)
Di-(2-ethylhexyl) phthalate (DEHP)	0.1% (1000mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000mg/kg)
Di-n-butyl phthalate (DBP)	0.1% (1000mg/kg)
Di-isobutyl phthalate (DIBP)	0.1% (1000mg/kg)

①Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound (RoHS Exemption 7(c)-I).

At the request of client, test was conducted on the certain component of submitted sample/submitted components

******** **To be continued** ********

4.RoHS Exemptions

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
1,Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	
1(a),For general lighting purposes < 30 W: 2,5 mg	Expires on 24 February 2023
1(b),For general lighting purposes ≥ 30 W and < 50 W: 3,5 mg	Expires on 24 February 2023
1(c),For general lighting purposes ≥ 50 W and < 150 W: 5 mg	Expires on 24 February 2023
1(d),For general lighting purposes ≥ 150 W: 15 mg	Expires on 24 February 2023
1(e),For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 5 mg	Expires on 24 February 2023
1(f)-I ,For lamps designed to emit mainly light in the ultraviolet spectrum: 5 mg	Expires on 24 February 2027
1(f)-II ,For special purposes: 5 mg	Expires on 24 February 2025'
1(g),For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg	Expires on 24 August 2023
2(a),Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):	
2(a)(1),Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 4 mg	Expires on 24 February 2023
2(a)(2),Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 3 mg	Expires on 24 February 2023
2(a)(3),Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8): 3,5 mg	Expires on 24 February 2023
2(a)(4),Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 3,5 mg	Expires on 24 February 2023
2(a)(5),Tri-band phosphor with long lifetime (≥ 25 000 h): 5 mg.	Expires on 24 February 2023
2(b), Mercury in other fluorescent lamps not exceeding (per lamp):	
2(b)(2), Non-linear halophosphate lamps (all diameters): 15 mg	Expires on 13 April 2016
2(b)(3), Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9):15mg	Expires on 24 February 2023; 10 mg may be used per lamp from 25 February 2023 until 24 February 2025
2(b)(4)-I ,Lamps for other general lighting and special purposes (e.g. induction lamps): 15 mg	Expires on 24 February 2025
2(b)(4)-II ,Lamps emitting mainly light in the ultraviolet spectrum: 15 mg	Expires on 24 February 2027
2(b)(4)-III ,Emergency lamps: 15 mg	Expires on 24 February 2027
3,Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes used in EEE placed on the market before 24 February 2022 not exceeding (per lamp):	
3(a),Short length (≤ 500 mm): 3,5 mg	Expires on 24 February 2025
3(b),Medium length (> 500 mm and ≤ 1 500 mm): 5 mg	Expires on 24 February 2025
3(c),Long length (> 1 500 mm): 13 mg	Expires on 24 February 2025
4(a),Mercury in other low pressure discharge lamps (per lamp): 15 mg	Expires on 24 February 2023
4(a)-I ,Mercury in low pressure non-phosphor coated discharge lamps, where the application requires the main range of the lampspectral output to be in the ultraviolet spectrum: up to 15 mg mercury may be used per lamp	Expires on 24 February 2027
4(b),Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 80: P ≤ 105 W: 16 mg may be used per burner	Expires on 24 February 2027
4(b)-I ,Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: P ≤ 155 W: 30 mg may be used per burner	Expires on 24 February 2023
4(b)-II ,Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: 155 W < P ≤ 405 W: 40 mg may be used per burner	Expires on 24 February 2023
4(b)-III ,Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: P > 405 W: 40 mg may be used per burner	Expires on 24 February 2023
4(c),Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
4(c)-I ,P ≤ 155 W: 20 mg	Expires on 24 February 2027
4(c)-II ,155 W < P ≤ 405 W: 25 mg	Expires on 24 February 2027
4(c)-III ,P > 405 W: 25 mg	Expires on 24 February 2027
4(e), Mercury in metal halide lamps (MH)	Expires on 24 February 2027
4(f)-I, Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex	Expires on 24 February 2025
4(f)-II, Mercury in high pressure mercury vapour lamps used in projectors where an output ≥ 2000 lumen ANSI is required	Expires on 24 February 2027
4(f)-III, Mercury in high pressure sodium vapour lamps used for horticulture lighting	Expires on 24 February 2027
4(f)-IV, Mercury in lamps emitting light in the ultraviolet spectrum	Expires on 24 February 2027
4(g), Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and light-artwork, where the mercury content shall be limited as follows: (a) 20 mg per electrode pair+0,3mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 ℃; (b) 15 mg per electrode pair+0,24mg per tube length in cm, but not more than 80 mg, for all other indoor applications	Expires on 31 December 2018’
5(a), Lead in glass of cathode ray tubes	
5(b), Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	
6(a), Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0,35 % lead by weight	Expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
6(a)-I, Lead as an alloying element in steel for machining purposes containing up to 0,35 % lead by weight and in batch hot dip galvanised steel components containing up to 0,2 % lead by weight	Expires on 21 July 2021 for categories 1-7 and 10.
6(b), Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	Expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical devices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
6(b)-I Lead as an alloying element in aluminium containing up to 0,4 % lead by weight, provided it stems from lead-bearing aluminium scrap recycling	Expires on 21 July 2021 for categories 1-7 and 10.
6(b)-II Lead as an alloying element in aluminium for machining purposes with a lead content up to 0,4 % by weight	Expires on 18 May 2021 for categories 1-7 and 10

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
6(c), Copper alloy containing up to 4 % lead by weight	Expires on: — 21 July 2021 for categories 1-7 and 10, —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
7(a), Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead)	Applies to categories 1-7 and 10 (except applications covered by point 24 of this Annex) and expires on 21 July 2021. For categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments expires on 21 July 2021. For category 8 in vitro diagnostic medical devices expires on 21 July 2023. For category 9 industrial monitoring and control instruments, and for category 11 expires on 21 July 2024.
7(b), Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications	
7(c)-I, Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound	Applies to categories 1-7 and 10 (except applications covered under point 34) and expires on 21 July 2021. For categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments expires on 21 July 2021. For category 8 in vitro diagnostic medical devices expires on 21 July 2023. For category 9 industrial monitoring and control instruments, and for category 11 expires on 21 July 2024.

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
7(c)-II, Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	Does not apply to applications covered by point 7(c)-I and 7(c)-IV of this Annex. Expires on: — 21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
7(c)-III, Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013
7(c)-Ⅳ, Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors	Expires on: — 21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
8(a), Cadmium and its compounds in one shot pellet type thermal cut-offs	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012
8(b), Cadmium and its compounds in electrical contacts	Applies to categories 8, 9 and 11 and expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
8(b)-I Cadmium and its compounds in electrical contacts used in: — circuit breakers, — thermal sensing controls, — thermal motor protectors (excluding hermetic thermal motor protectors), — AC switches rated at: — 6 A and more at 250 V AC and more, or — 12 A and more at 125 V AC and more, — DC switches rated at 20 A and more at 18 V DC and more, and — switches for use at voltage supply frequency ⩾ 200 Hz.	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
9, Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution	Applies to categories 8, 9 and 11 and expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
9(a)-I Up to 0,75 % hexavalent chromium by weight, used as an anticorrosion agent in the cooling solution of carbon steel cooling systems of absorption refrigerators (including minibars) designed to operate fully or partly with electrical heater, having an average utilised power input < 75 W at constant running conditions	Applies to categories 1-7 and 10 and expires on 5 March 2021.
9(a)-II Up to 0,75 % hexavalent chromium by weight, used as an anticorrosion agent in the cooling solution of carbon steel cooling systems of absorption refrigerators: — designed to operate fully or partly with electrical heater, having an average utilized power input ⩾ 75 W at constant running conditions, — designed to fully operate with non-electrical heater.	Applies to categories 1-7 and 10 and expires on 5 March 2021.
9(b), Lead in bearing shells and bushes for refrigerant- containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	Applies to categories 8, 9 and 11; expires on: — 21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments and for category 11, —21 July 2021 for other subcategories of categories 8 and 9.
9(b)-(I), Lead in bearing shells and bushes for refrigerant- containing hermetic scroll compressors with a stated electrical power input equal or below 9 kW for heating, ventilation, air conditioning and refrigeration (HVACR) applications	Applies to category 1; expires on 21 July 2019.’
11(a), Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b), Lead used in other than C-press compliant pin connector systems	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
12, Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
13(a), Lead in white glasses used for optical applications	Applies to all categories; expires on: — 21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; — 21 July 2021 for all other categories and subcategories
13(b),Cadmium and lead in filter glasses and glasses used for reflectance standards	Applies to categories 8, 9 and 11; expires on: — 21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; —21 July 2021 for other subcategories of categories 8 and 9
13(b)-(I),Lead in ion coloured optical filter glass types	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10’
13(b)-(II) ,Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10’
13(b)-(III), Cadmium and lead in glazes used for reflectance standards	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10’
14, Lead in solders consisting of more than two elements for the connection between the pins and the package of micropro-cessors with a lead content of more than 80 % and less than 85 % by weight	Expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011
15, Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	Applies to categories 8, 9 and 11 and expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
15(a) Lead in solders to complete a viable electrical connection between the semiconductor die and carrier within integrated circuit flip chip packages where at least one of the following criteria applies: — a semiconductor technology node of 90 nm or larger; —a single die of 300 mm^2 or larger in any semiconductor technology node; —stacked die packages with die of 300 mm^2 or larger, or silicon interposers of 300 mm^2 or larger.	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
17, Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications	

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
18(b), Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($BaSi_2O_5$:Pb)	Expires on: — 21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
18(b)-I Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps containing phosphors such as BSP (BaSi2O5:Pb) when used in medical phototherapy equipment	Applies to categories 5 and 8, excluding applications covered by entry 34 of Annex IV, and expires on 21 July 2021.
21, Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	Applies to categories 8, 9 and 11 and expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
21(a) Cadmium when used in colour printed glass to provide filtering functions, used as a component in lighting applications installed in displays and control panels of EEE	Applies to categories 1 to 7 and 10 except applications covered by entry 21(b) or entry 39 and expires on 21 July 2021.
21(b) Cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	Applies to categories 1 to 7 and 10 except applications covered by entry 21(a) or 39 and expires on 21 July 2021.
21(c) Lead in printing inks for the application of enamels on other than borosilicate glasses	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
23, Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
24, Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Expires on: — 21 July 2021 for categories 1-7 and 10, — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
25, Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring	
29, Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC ([1])	Expires on: — 21 July 2021 for categories 1-7 and 10; — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and ontrol instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
30, Cadmium alloys as electrical/mechanical solder joints to elec-trical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more	
31, Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)	
32, Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	Expires on: — 21 July 2021 for categories 1-7 and 10, — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
33, Lead in solders for the soldering of thin copper wires of 100 μm diameter and less in power transformers	

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
34, Lead in cermet-based trimmer potentiometer elements	Applies to all categories; expires on: — 21 July 2021 for categories 1-7 and 10, —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
37, Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	Expires on: — 21 July 2021 for categories 1-7 and 10; — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
38, Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39(a), Cadmium selenide in downshifting cadmium-based semiconductor nanocrystal quantum dots for use in display lighting applications (< 0,2 µg Cd per mm2 of display screen area)	Expires for all categories on 31 October 2019.

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
41, Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council)	Applies to all categories and expires on: — 31 March 2022 for categories 1 to 7, 10 and 11; — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments.
42, Lead in bearings and bushes of diesel or gaseous fuel powered internal combustion engines applied in non-road professional use equipment: — with engine total displacement ⩾ 15 litres; or — with engine total displacement < 15 litres and the engine is designed to operate in applications where the time between signal to start and full load is required to be less than 10 seconds; or regular maintenance is typically performed in a harsh and dirty outdoor environment, such as mining, construction, and agriculture application	Applies to category 11, excluding applications covered by entry 6(c) of this Annex. Expires on 21 July 2024.

Exemptions	
RoHS Directive 2011/65/EU ANNEX III and its subsequent amendments	
Exemption Items	**Expires Date**
43, Bis(2-ethylhexyl) phthalate in rubber components in engine systems, designed for use in equipment that is not intended solely for consumer use and provided that no plasticised material comes into contact with human mucous membranes or into prolonged contact with human skin and the concentration value of bis(2-ethylhexyl) phthalate does not exceed: (a) 30 % by weight of the rubber for (i) gasket coatings; (ii) solid-rubber gaskets; or (iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine. (b) 10 % by weight of the rubber for rubber-containing components not referred to in point (a). For the purposes of this entry, “prolonged contact with human skin” means continuous contact of more than 10 minutes duration or intermittent contact over a period of 30 minutes, per day.	Applies to category 11 and expires on 21 July 2024.’
44. Lead in solder of sensors, actuators, and engine control units of combustion engines within the scope of Regulation (EU) 2016/1628 of the European Parliament and of the Council (*) , installed in equipment used at fixed positions while in operation which is designed for professionals, but also used by non-professional users	Applies to category 11 and expires on 21 July 2024.
45. Lead diazide, lead styphnate, lead dipicramate, orange lead (lead tetroxide), lead dioxide in electric and electronic initiators of explosives for civil (professional) use and barium chromate in long time pyrotechnic delay charges of electric initiators of explosives for civil (professional) use	Applies to category 11 and expires on 20 April 2026’
Note: (1) OJ L 326, 29.12.1969, p.36. (*) Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) No 1024/2012 and (EU) No 167/2013, and amending and repealing Directive 97/68/EC (OJ L 252, 16.9.2016, p. 53).’	

Exemptions	
RoHS Directive 2011/65/EU ANNEX IV and its subsequent amendments Equipment utilising or detecting ionising radiation	
Exemption Items	**Expires Date**
1. Lead, cadmium and mercury in detectors for ionising radiation.	
2. Lead bearings in X-ray tubes.	
3. Lead in electromagnetic radiation amplification devices: micro-channel plate and capillary plate.	

Exemptions	
RoHS Directive 2011/65/EU ANNEX IV and its subsequent amendments Equipment utilising or detecting ionising radiation	
Exemption Items	**Expires Date**
4. Lead in glass frit of X-ray tubes and image intensifiers and lead in glass frit binder for assembly of gas lasers and for vacuum tubes that convert electromagnetic radiation into electrons.	
5. Lead in shielding for ionising radiation.	
6. Lead in X-ray test objects.	
7. Lead stearate X-ray diffraction crystals.	
8. Radioactive cadmium isotope source for portable X-ray fluorescence spectrometers. Sensors, detectors and electrodes	
8.1a. Lead and cadmium in ion selective electrodes including glass of pH electrodes.	
8.1b. Lead anodes in electrochemical oxygen sensors.	
8.1c. Lead, cadmium and mercury in infra-red light detectors.	
8.1d. Mercury in reference electrodes: low chloride mercury chloride, mercury sulphate and mercury oxide.	
9. Cadmium in helium-cadmium lasers.	
10. Lead and cadmium in atomic absorption spectroscopy lamps.	
11. Lead in alloys as a superconductor and thermal conductor in MRI.	
12. Lead and cadmium in metallic bonds creating superconducting magnetic circuits in MRI, SQUID, NMR (Nuclear Magnetic Resonance) or FTMS (Fourier Transform Mass Spectrometer) detectors.	Expires on 30 June 2021
13. Lead in counterweights.	
14. Lead in single crystal piezoelectric materials for ultrasonic transducers.	
15. Lead in solders for bonding to ultrasonic transducers.	
16. Mercury in very high accuracy capacitance and loss measurement bridges and in high frequency RF switches and relays in monitoring and control instruments not exceeding 20 mg of mercury per switch or relay.	
17. Lead in solders in portable emergency defibrillators.	
18. Lead in solders of high performance infrared imaging modules to detect in the range 8-14 µm.	
19. Lead in Liquid crystal on silicon (LcoS) displays.	
20. Cadmium in X-ray measurement filters.	
21. Cadmium in phosphor coatings in image intensifiers for X-ray images until 31 December 2019 and in spare parts for X-ray systems placed on the EU market before 1 January 2020.	
22. Lead acetate marker for use in stereotactic head frames for use with CT and MRI and in positioning systems for gamma beam and particle therapy equipment.	Expires on 30 June 2021.
23. Lead as an alloying element for bearings and wear surfaces in medical equipment exposed to ionising radiation.	Expires on 30 June 2021
24. Lead enabling vacuum tight connections between aluminium and steel in X-ray image intensifiers.	Expires on 31 December 2019
25. Lead in the surface coatings of pin connector systems requiring nonmagnetic connectors which are used durably at a temperature below – 20 °C under normal operating and storage conditions.	Expires on 30 June 2021

Exemptions	
RoHS Directive 2011/65/EU ANNEX IV and its subsequent amendments Equipment utilising or detecting ionising radiation	
Exemption Items	**Expires Date**
26. Lead in the following applications that are used durably at a temperature below – 20 °C under normal operating and storage conditions: (a) solders on printed circuit boards; (b)termination coatings of electrical and electronic components and coatings of printed circuit boards; (c) solders for connecting wires and cables; (d) solders connecting transducers and sensors. Lead in solders of electrical connections to temperature measurement sensors in devices which are designed to be used periodically at temperatures below – 150 °C.	Expires on 30 June 2021
27. Lead in — solders, — termination coatings of electrical and electronic components and printed circuit boards, — connections of electrical wires, shields and enclosed connectors, which are used in magnetic fields within the sphere of 1 m radius around the isocentre of the magnet in medical magnetic resonance imaging equipment, including patient monitors designed to be used within this sphere, or magnetic fields within 1 m distance from the external surfaces of cyclotron magnets, magnets for beam transport and beam direction control applied for particle therapy.	Expires on 30 June 2020
28. Lead in solders for mounting cadmium telluride and cadmium zinc telluride digital array detectors to printed circuit boards.	Expires on 31 December 2017
29. Lead in alloys, as a superconductor or thermal conductor, used in cryo-cooler cold heads and/or in cryo-cooled cold probes and/or in cryo-cooled equipotential bonding systems, in medical devices (category 8) and/or in industrial monitoring and control instruments.	Expires on 30 June 2021
30. Hexavalent chromium in alkali dispensers used to create photocathodes in X-ray image intensifiers until 31 December 2019 and in spare parts for X-ray systems placed on the EU market before 1 January 2020.	
31a. Lead, cadmium, hexavalent chromium, and polybrominated diphenyl ethers (PBDE) in spare parts recovered from and used for the repair or refurbishment of medical devices, including in vitro diagnostic medical devices, or electron microscopes and their accessories, provided that the reuse takes place in auditable closed-loop business-to-business return systems and that each reuse of parts is notified to the customer.	Expires on: (a) 21 July 2021 for the use in medical devices other than in vitro diagnostic medical devices; (b) 21 July 2023 for the use in in vitro diagnostic medical devices; (c) 21 July 2024 for the use in electron microscopes and their accessories.’
32. Lead in solders on printed circuit boards of detectors and data acquisition units for Positron Emission Tomographs which are integrated into Magnetic Resonance Imaging equipment.	Expires on 31 December 2019
33. Lead in solders on populated printed circuit boards used in Directive 93/42/EEC class IIa and IIb mobile medical devices other than portable emergency defibrillators.	Expires on 30 June 2016 for class IIa and on 31 December 2020 for class IIb.
34. Lead as an activator in the fluorescent powder of discharge lamps when used for extracorporeal photopheresis lamps containing BSP ($BaSi_2O_5$:Pb) phosphors.	Expires on 22 July 2021

Exemptions	
RoHS Directive 2011/65/EU ANNEX IV and its subsequent amendments Equipment utilising or detecting ionising radiation	
Exemption Items	**Expires Date**
35. Mercury in cold cathode fluorescent lamps for back-lighting liquid crystal displays, not exceeding 5 mg per lamp, used in industrial monitoring and control instruments placed on the market before 22 July 2017	Expires on 21 July 2024
36. Lead used in other than C-press compliant pin connector systems for industrial monitoring and control instruments.	Expires on 31 December 2020. May be used after that date in spare parts for industrial monitoring and control instruments placed on the market before 1 January 2021.'
37. Lead in platinized platinum electrodes used for conductivity measurementswhere at least one of the following conditions applies: (a) wide-range measurements with a conductivity range covering more than 1 order of magnitude (e.g. range between 0,1 mS/m and 5 mS/m) in laboratory applications for unknown concentrations; (b) measurements of solutions where an accuracy of +/– 1 % of the sample range and where high corrosion resistance of the electrode are required for any of the following: (i) solutions with an acidity < pH 1; (ii) solutions with an alkalinity > pH 13; (iii) corrosive solutions containing halogen gas; (c) measurements of conductivities above 100 mS/m that must be performed with portable instruments.	Expires on 31 December 2025
38. Lead in solder in one interface of large area stacked die elements with more than 500 interconnects per interface which are used in X-ray detectors of computed tomography and X-ray systems	Expires on 31 December 2019. May be used after that date in spare parts for CT and X-ray systems placed on the market before 1 January 2020.
39. Lead in micro-channel plates (MCPs) used in equipment where at least one of the following properties is present: (a)a compact size of the detector for electrons or ions, where the space for the detector is limited to a maximum of 3 mm/MCP (detector thickness+space for installation of the MCP), a maximum of 6 mm in total, and an alternative design yielding more space for the detector is scientifically and technically impracticable; (b)a two-dimensional spatial resolution for detecting electrons or ions, where at least one of the following applies: (i)a response time shorter than 25 ns; (ii)a sample detection area larger than 149 mm^2; (iii)a multiplication factor larger than $1,3 \times 10^3$. (c)a response time shorter than 5 ns for detecting electrons or ions; (d)a sample detection area larger than 314 mm^2 for detecting electrons or ions; (e)a multiplication factor larger than $4,0 \times 10^7$.	(a) 21 July 2021 for medical devices and monitoring and control instruments; (b) 21 July 2023 for in-vitro diagnostic medical devices; (c) 21 July 2024 for industrial monitoring and control instruments
40. Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC for industrial monitoring and control instruments	Expires on 31 December 2020. May be used after that date in spare parts for industrial monitoring and control instruments placed on the market before 1 January 2021
41. Lead as a thermal stabiliser in polyvinyl chloride (PVC) used as base material in amperometric, potentiometric and conductometric electrochemical sensors which are used in in-vitro diagnostic medical devices for the analysis of blood and other body fluids and body gases.	Expires on 31 March 2022
42. Mercury in electric rotating connectors used in intravascular ultrasound imaging systems capable of high operating frequency (> 50 MHz) modes of operation.	Expires on 30 June 2026
43. Cadmium anodes in Hersch cells for oxygen sensors used in industrial monitoring and control instruments, where sensitivity below 10 ppm is required.	Expires on 15 July 2023

Exemptions	
RoHS Directive 2011/65/EU ANNEX IV and its subsequent amendments Equipment utilising or detecting ionising radiation	
Exemption Items	**Expires Date**
44. Cadmium in radiation tolerant video camera tubes designed for cameras with a centre resolution greater than 450 TV lines which are used in environments with ionising radiation exposure exceeding 100 Gy/hour and a total dose in excess of 100kGy.	Applies to category 9. Expires on 31 March 2027.
45. Bis(2-ethylhexyl) phthalate (DEHP) in ion-selective electrodes applied in point of care analysis of ionic substances present in human body fluids and/or in dialysate fluids	Expires on 21 July 2028.
46. Bis(2-ethylhexyl) phthalate (DEHP) in plastic components in MRI detector coils	Expires on 1 January 2024.
47. Bis(2-ethylhexyl) phthalate (DEHP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP) and diisobutyl phthalate (DIBP) in spare parts recovered from and used for the repair or refurbishment of medical devices, including in vitro diagnostic medical devices, and their accessories, provided that the reuse takes place in auditable closed-loop businessto-business return systems and that each reuse of parts is notified to the customer	Expires on 21 July 2028.

TESTS UNCERTAINTY

Unless otherwise stated the uncertainties for the tests and measurements are those listed in STQ Operational Instruction, in according to IEC Guide 115 “Application of Uncertainty of measurement’s to Conformity Assessment Activity in the Electrotechnical Sector” and IECEE CTL decision sheet DSH 251B.

MEASUREMENT EQUIPMENT AND INSTRUMENTATION

Instrument	Manufacturer	Model
XRF	HORRIBA	MESA-50
ICP-OES	Agilent	710ES
GC-MS	Thermos	ISQ
Uv-vis	Jingke	UV-759S

PHOTOGRAPHS

EUT IDENTIFICATION

PRODUCT PHOTOS

JX266361

JX344061

END OF TEST REPORT

ANNEX 1: MODEL LIST

Representative models tested in this report:
JX266361, JX344061

Addtional models covered in this report based on the material declaration provided by the manufactuer:
JX250640, JX251040, JX251640, JX252540, JX252040, JX253240, JX250642, JX251042, JX251642, JX252042, JX252542, JX253242, JX250661, JX251061, JX251661, JX252061, JX252561, JX253261, JX250662, JX251062, JX251662, JX252062, JX252562, JX253262, JX261661, JX263261, JX265061, JX263263, JX264063, JX265063, JX260661, JX260662, JX261062, JX261662, JX262062, JX262562, JX263262, JX264062, JX265062, JX266362, JX260663, JX271061, JX272061, JX272561, JX273261, JX274061, JX270663, JX271063, JX271663, JX272063, JX272563, JX273263, JX274063, JX270662, JX271062, JX271662, JX272062, JX272562, JX273262, JX274062, JX271664, JX272064, JX272564, JX273264, JX270664, JX274064, JX270667, JX271067, JX271667, JX272067, JX272567, JX273267, JX274067, JX270668, JX271068, JX271668, JX272068, JX272568, JX273268, JX274068, JX321661, JX322561, JX324061, JX326361, JX321663, JX322563, JX324063, JX326363, JX341661, JX342561, JX346361, JX341663, JX342563, JX344063, JX346363, JX321662, JX322562, JX324062, JX326362, JX341662, JX342562, JX344062, JX346362