



# Verification Report

Report No. A2210085546101001R1

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## CENTRE TESTING INTERNATIONAL



**Company Name shown on Report** SHANGHAI LEIPOLD ELECTRIC CO.,LTD.  
**Address** NO.1569 SIYI ROAD,JIADING DISTRICT, SHANGHAI  
**Product Name** heater  
**Product Part No.** JRQ60

### Conclusion

Tested Sample	According to standard/directive	Result
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	PASS

PASS means that the results shown on the report comply with the limits set by RoHS Directive 2011/65/EU with amendment(EU) 2015/863.

Tested by

*Ge Xiaobian*

Reviewed by

*Shendunxia*

Approved by

*Chen Kaimin*

Date

Apr. 13, 2021

Chen kaimin  
Lab Manager

No. R201809754

Centre Testing International Pinbiao(Shanghai) Co., Ltd.

No.1351, Wanfang Road, Minhang District, Shanghai, China



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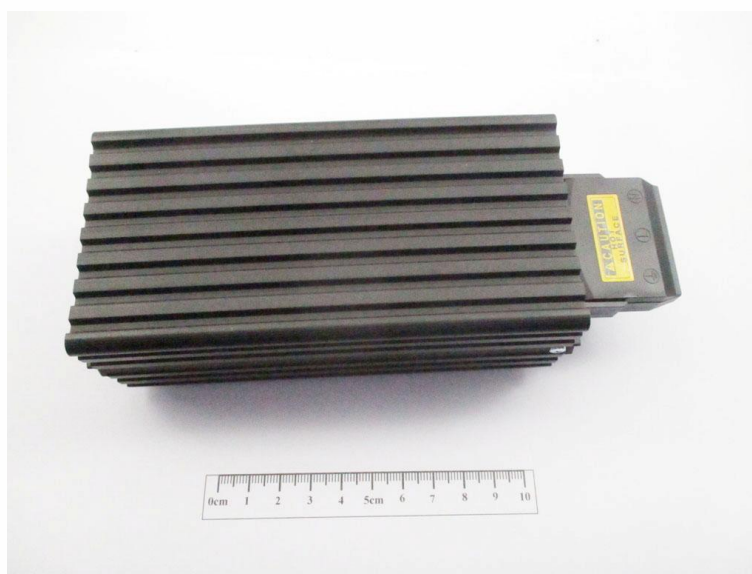
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Sample Received Date Mar. 15, 2021  
Testing Period Mar. 15, 2021 to Apr. 9, 2021

**Test Requested** With reference to RoHS Directive 2011/65/EU with amendment (EU) 2015/863, to conduct verification test for Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs) and Phthalates (Dibutyl phthalate(DBP), Benzylbutyl phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP), Diisobutyl phthalate(DIBP)) in the submitted samples.

## Photo(s) of the Product(s)

**Final Product**



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## Test Method

### A. Screening limits for regulated elements according to IEC 62321-3-1:2013 Ed.1.0 (Unit: mg/kg)

Element	Polymers	Metals	Composite material
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$
Br	$BL \leq (300-3\sigma) < X$	N/A	$BL \leq (250-3\sigma) < X$

### B. Chemical Test

Tested Item(s)	Test Method	Measured Equipment(s)	MDL	Limit
Lead (Pb)	IEC 62321-5:2013	ICP-OES	10 mg/kg	1000 mg/kg
	Refer to IEC 62321-5:2013		10 mg/kg	
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES	10 mg/kg	100 mg/kg
	Refer to IEC 62321-5:2013		10 mg/kg	
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CS V	ICP-OES	10 mg/kg	1000 mg/kg
	Refer to IEC 62321-4:2013+AMD1:2017 CS V		10 mg/kg	
Hexavalent Chromium (Cr(VI))	IEC 62321-7-2:2017	UV-Vis	20 mg/kg	1000 mg/kg
	IEC 62321-7-1:2015		0.10 $\mu\text{g}/\text{cm}^2$ (LOQ)	
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS	100 mg/kg	1000 mg/kg
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS	100 mg/kg	1000 mg/kg
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS	50 mg/kg	1000 mg/kg for each

### Remark:

- BL = Under the XRF screening limit
- OL = Above the screening limit
- X = The range of needing to do further testing
- $3\sigma$  = The reproducibility of analytical instruments
- N/A = Not applicable
- LOD = Detection limit
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10  $\mu\text{g}/\text{cm}^2$

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## Test Result(s)

Sample No.	Same material No.	Sample Description	Tested Item(s)	XRF Screening Test	Chemical Test (mg/kg)	Conclusion	Sample Received/ Resubmitted Date
1	2	Metal with black plating	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	IN	N.D.▼		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
	-	Yellow adhesive tape	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
	-	Silvery metal	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	IN	N.D.▼		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
	-	Silver/Brown ceramic	Pb	OL	158500 <sup>#</sup>	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
	-	Silver/Brown ceramic	Pb	OL	158500 <sup>#</sup>	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
	-	Silver/Brown ceramic	Pb	OL	158500 <sup>#</sup>	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
	-	Silver/Brown ceramic	Pb	OL	158500 <sup>#</sup>	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
	-	Silver/Brown ceramic	Pb	OL	158500 <sup>#</sup>	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		

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Sample No.	Same material No.	Sample Description	Tested Item(s)	XRF Screening Test	Chemical Test (mg/kg)	Conclusion	Sample Received/ Resubmitted Date
6	7	Metal with light blue plating	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		
8	-	Silvery metal	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		
9	-	Silvery metal	Pb	BL	/	PASS	Mar. 15, 2021 Mar. 22, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	IN	N.D.▼		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		
10	-	Silvery label with black printing	Pb	BL	/	PASS	Mar. 15, 2021 Mar. 22, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		

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Sample No.	Same material No.	Sample Description	Tested Item(s)	XRF Screening Test	Chemical Test (mg/kg)	Conclusion	Sample Received/ Resubmitted Date
11	-	Black plastic	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
12	-	Black plastic	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
13	-	White rubber casing	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	67		
			DIBP	N/A	N.D.		
14	-	Yellow label with black printing	Pb	BL	/	PASS	Mar. 15, 2021 Mar. 22, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		

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Sample No.	Same material No.	Sample Description	Tested Item(s)	XRF Screening Test	Chemical Test (mg/kg)	Conclusion	Sample Received/ Resubmitted Date
15	-	Orange plastic	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
16	-	Black plastic	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
17	-	Black plastic	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
18	-	Silvery metal	Pb	BL	/	PASS	Mar. 15, 2021 Mar. 22, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	IN	N.D. ▼		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		



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Sample No.	Same material No.	Sample Description	Tested Item(s)	XRF Screening Test	Chemical Test (mg/kg)	Conclusion	Sample Received/ Resubmitted Date
19	-	Silvery metal	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		
20	-	Metal with silvery plating	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		
21	-	Golden metal	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		
22	-	Metal with silvery plating	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		

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Sample No.	Same material No.	Sample Description	Tested Item(s)	XRF Screening Test	Chemical Test (mg/kg)	Conclusion	Sample Received/ Resubmitted Date
23	-	Yellow plastic	Pb	BL	/	PASS	Mar. 15, 2021 Mar. 22, 2021 Apr. 1, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	IN	N.D.		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
24	-	Red plastic wire jacket	Pb	BL	/	PASS	Mar. 15, 2021 Mar. 22, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	BL	/		
			DBP	N/A	N.D.		
			BBP	N/A	N.D.		
			DEHP	N/A	N.D.		
			DIBP	N/A	N.D.		
25	-	Silvery metal wire	Pb	BL	/	PASS	Mar. 15, 2021
			Cd	BL	/		
			Hg	BL	/		
			Cr(Cr(VI))	BL	/		
			Br(PBBs&PBDEs)	N/A	/		
			DBP	N/A	/		
			BBP	N/A	/		
			DEHP	N/A	/		
			DIBP	N/A	/		

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**Remark:**

- N.D. = Not Detected (<MDL or LOQ)
- MDL = Method Detection Limit
- mg/kg = ppm = parts per million
- 1000 mg/kg = 0.1%
- /=Not tested
- N/A= Not applicable
- IN= Uncertain, Further chemical test
- BL = Under the screening limit
- OL = Further chemical test will be conducted while the result is above the screening limit.
- ▼ The sample is negative for Cr(VI) – The Cr(VI) concentration is below  $0.10\mu\text{g}/\text{cm}^2$ .  
The coating is considered a non-Cr(VI) based coating.
- When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.
- # According to the client's statement, the material of the sample(s) fall into exemption items 7(c)-I according to EU Directive 2011/65/EU: 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.
- According to the client's statement, the samples in the column "Same material No." are of the same as the "Sample No."

**Note:**

This testing report revised "Company Name shown on Report/ Address" based on the original report of No. A2210085546101001. This testing report displaces the original one which was invalid since the date of this testing report released.

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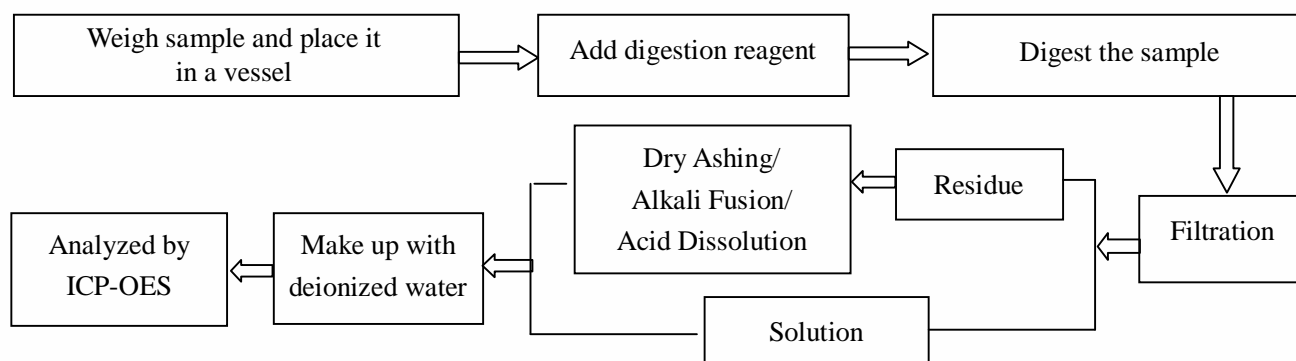
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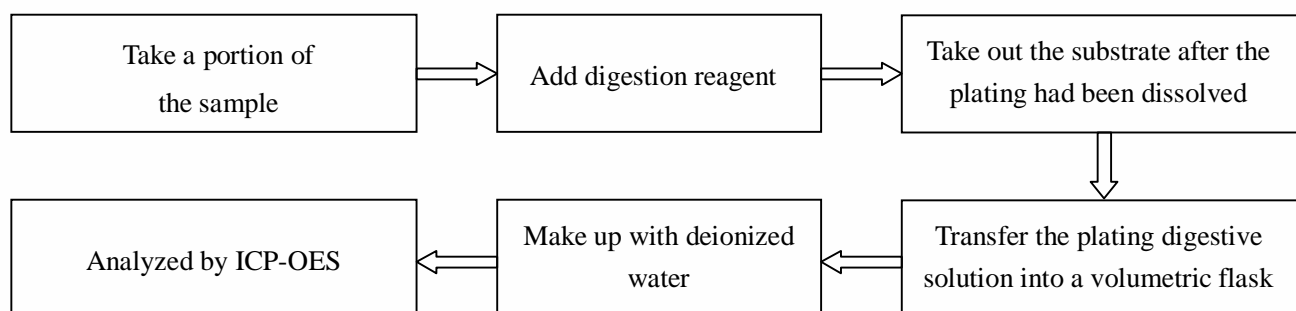
## Test Process

### 1. Lead (Pb), Cadmium (Cd)

#### 1) IEC 62321-5:2013

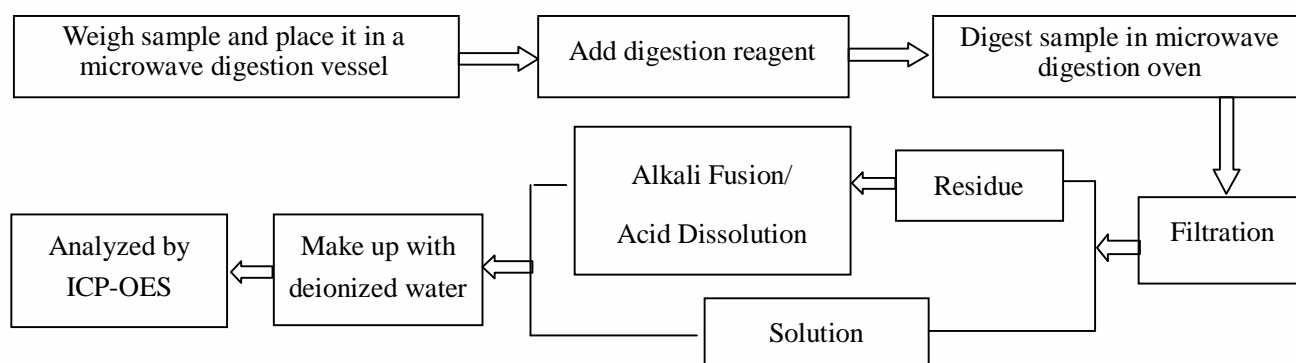


#### 2) Refer to IEC 62321-5:2013



### 2. Mercury (Hg)

#### 1) IEC 62321-4:2013+AMD1:2017 CSV

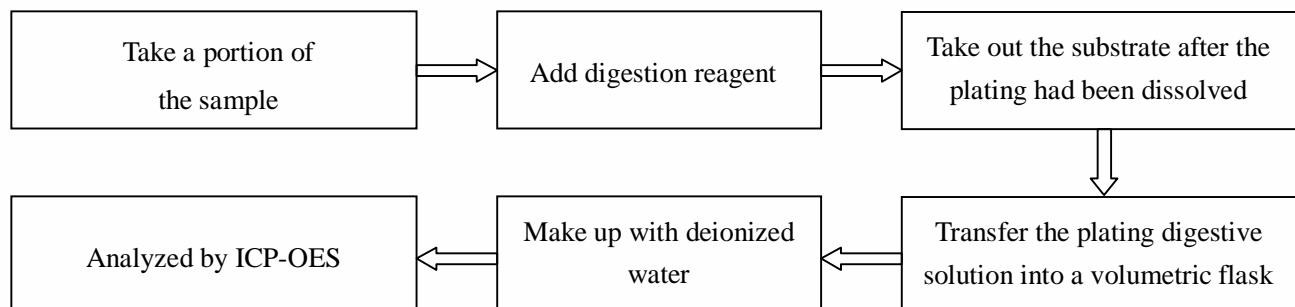


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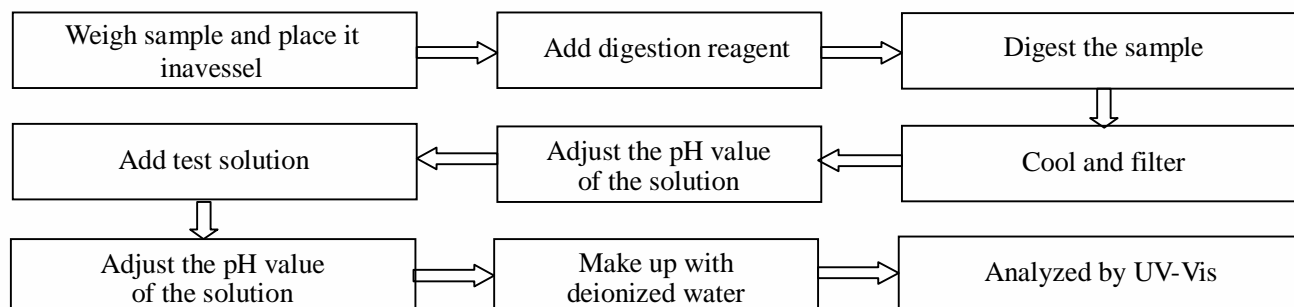
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## 2) Refer to IEC 62321-4:2013+AMD1:2017 CSV

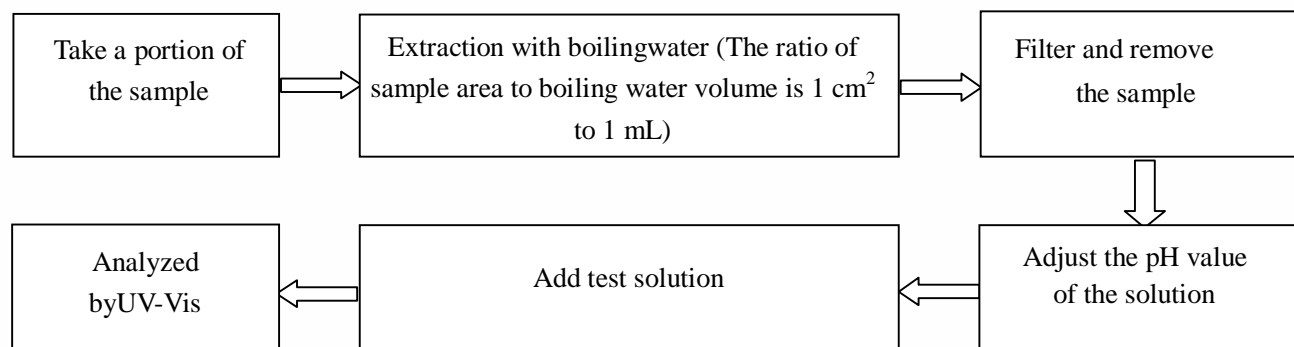


## 3. Hexavalent Chromium (Cr(VI))

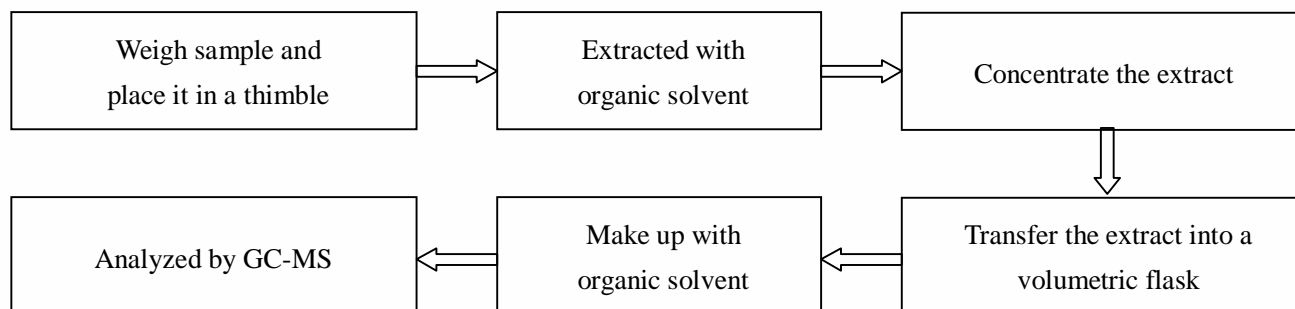
### 1) IEC 62321-7-2:2017



### 2) IEC 62321-7-1:2015



## 4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)

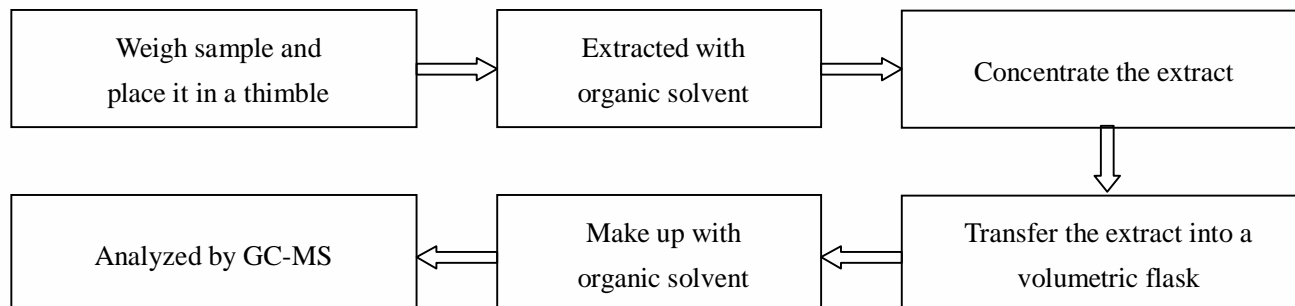


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## 5. Phthalates(DBP, BBP, DEHP, DIBP)

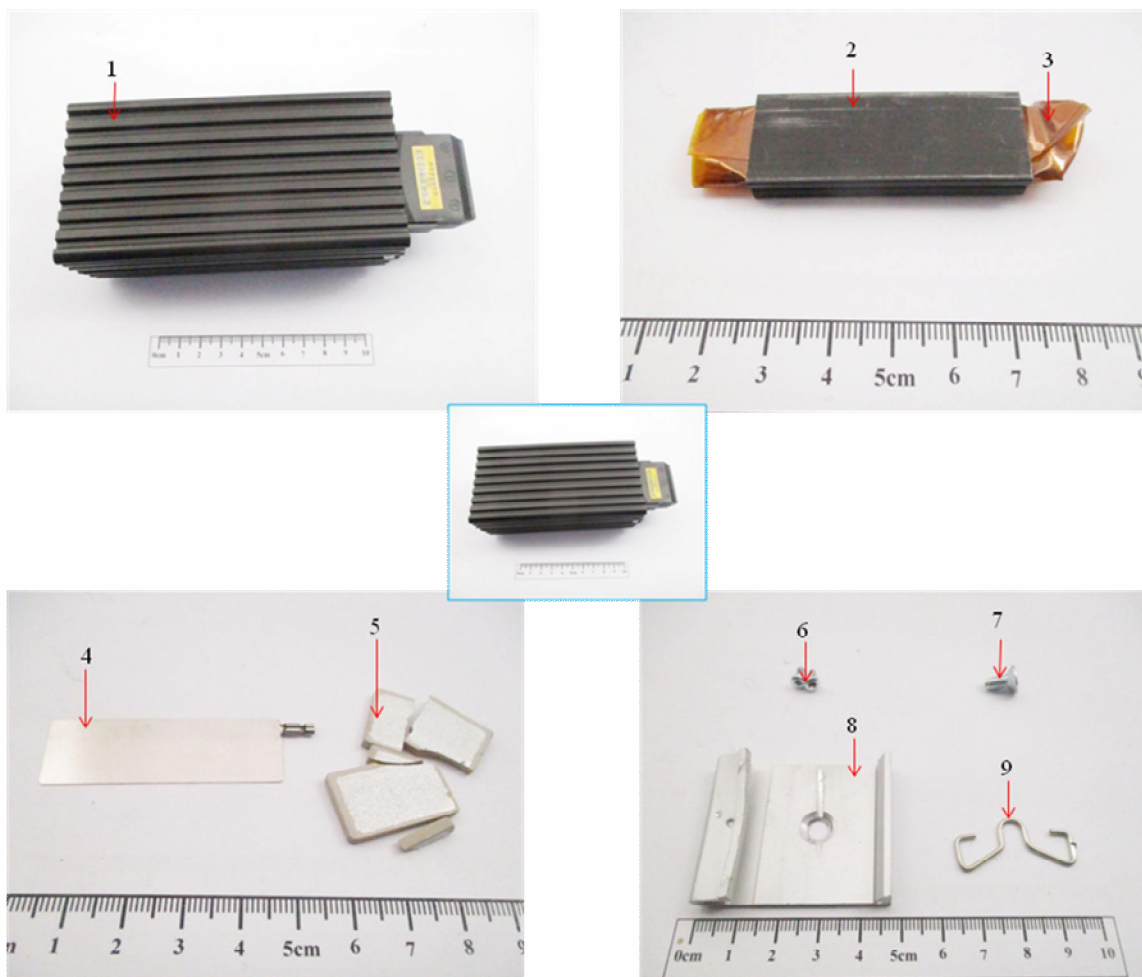


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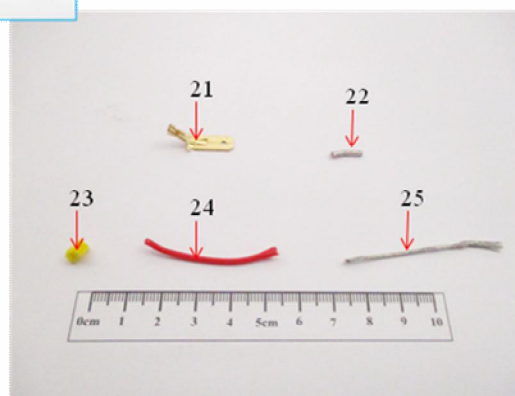
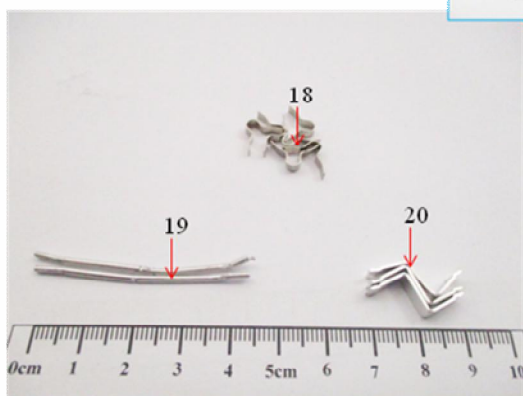
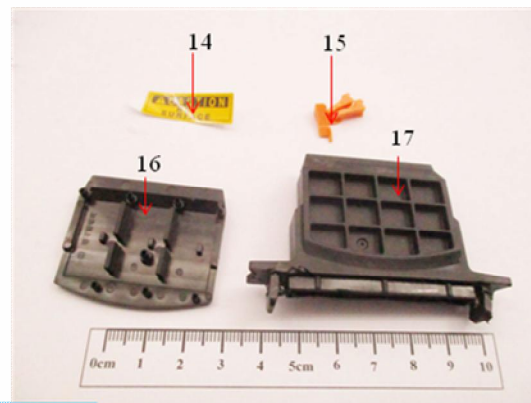
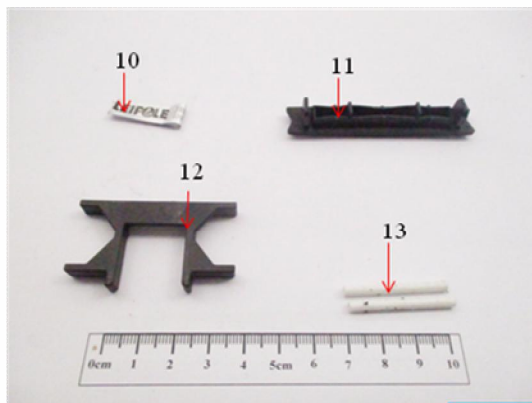
## Photo(s) of the tested component(s)



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## Exempted Items of RoHS Directive

In accordance with Directive 2011/65/EU as amended, there are 44 exemption items in Annex III of 2011/65/EU altogether.

	Exemption	Scope and dates of applicability
1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	
1(a)	For general lighting purposes < 30 W: 5 mg	Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011 until 31 December 2012; 2,5 mg shall be used per burner after 31 December 2012
1(b)	For general lighting purposes $\geq$ 30 W and < 50 W: 5 mg	Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011
1(c)	For general lighting purposes $\geq$ 50 W and < 150 W: 5 mg	
1(d)	For general lighting purposes $\geq$ 150 W: 15 mg	
1(e)	For general lighting purposes with circular or square structural shape and tube diameter $\leq$ 17 mm	No limitation of use until 31 December 2011; 7 mg may be used per burner after 31 December 2011
1(f)	For special purposes: 5 mg	
1(g)	For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg	Expires on 31 December 2017
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): 5 mg	Expires on 31 December 2011; 4 mg may be used per lamp after 31 December 2011
2(a)(2)	Tri-band phosphor with normal lifetime and a tube diameter $\geq$ 9 mm and $\leq$ 17 mm (e.g. T5): 5 mg	Expires on 31 December 2011; 3 mg may be used per lamp after 31 December 2011
2(a)(3)	Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and $\leq$ 28 mm (e.g. T8): 5 mg	Expires on 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
2(a)(4)	Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 5 mg	Expires on 31 December 2012; 3,5 mg may be used per lamp after 31 December 2012
2(a)(5)	Tri-band phosphor with long lifetime ( $\geq$ 25 000 h): 8 mg	Expires on 31 December 2011; 5 mg may be used per lamp after 31 December 2011
2(b)	Mercury in other fluorescent lamps not exceeding (per lamp):	

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	Exemption	Scope and dates of applicability
2(b)(1)	Linear halophosphate lamps with tube > 28 mm (e.g. T10 and T12): 10 mg	Expires on 13 April 2012
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)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
2(b)(4)	Lamps for other general lighting and special purposes (e.g. induction lamps)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
3	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):	
3(a)	Short length ( $\leq 500$ mm)	No limitation of use until 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
3(b)	Medium length (> 500 mm and $\leq 1\,500$ mm)	No limitation of use until 31 December 2011; 5 mg may be used per lamp after 31 December 2011
3(c)	Long length (> 1 500 mm)	No limitation of use until 31 December 2011; 13 mg may be used per lamp after 31 December 2011
4(a)	Mercury in other low pressure discharge lamps (per lamp)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
4(b)	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 60$ :	
4(b)-I	$P \leq 155$ W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011
4(b)-II	$155\text{ W} < P \leq 405\text{ W}$	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(b)-III	$P > 405$ W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011

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	Exemption	Scope and dates of applicability
4(c)	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	
4(c)-I	$P \leq 155 \text{ W}$	No limitation of use until 31 December 2011; 25 mg may be used per burner after 31 December 2011
4(c)-II	$155 \text{ W} < P \leq 405 \text{ W}$	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011
4(c)-III	$P > 405 \text{ W}$	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(d)	Mercury in High Pressure Mercury (vapour) lamps (HPMV)	Expires on 13 April 2015
4(e)	Mercury in metal halide lamps (MH)	
4(f)	Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex	
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 + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 °C; (b) 15 mg per electrode pair + 0,24 mg 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	

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	Exemption	Scope and dates of applicability
6(a)	Lead as an alloying element in steel for machining purposes and in galvanised 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.

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	Exemption	Scope and dates of applicability
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.

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	Exemption	Scope and dates of applicability
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 which are part of integrated circuits or discrete semiconductors	-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

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	Exemption	Scope and dates of applicability
8(b)-I	<p>Cadmium and its compounds in electrical contacts used in:</p> <ul style="list-style-type: none"> <li>-circuit breakers,</li> <li>-thermal sensing controls,</li> <li>-thermal motor protectors (excluding hermetic thermal motor protectors),</li> <li>-AC switches rated at:</li> <li>-6 A and more at 250 V AC and more, or</li> <li>-12 A and more at 125 V AC and more,</li> <li>-DC switches rated at 20 A and more at 18 V DC and more, and</li> <li>-switches for use at voltage supply frequency <math>\geq</math> 200 Hz</li> </ul>	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	<p>Applies to categories 8, 9 and 11 and expires on:</p> <ul style="list-style-type: none"> <li>—21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments,</li> <li>—21 July 2023 for category 8 in vitro diagnostic medical devices,</li> <li>—21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.</li> </ul>
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.

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	Exemption	Scope and dates of applicability
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 utilised power input $\geq 75$ W at constant running conditions, —designed to fully operate with non-electrical heater.	Applies to categories 1-7 and 10 and expires on 21 July 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 C-press	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
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



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	Exemption	Scope and dates of applicability
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	
13(b)-III	Cadmium and lead in glazes used for reflectance standards	
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight	Expired 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

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	Exemption	Scope and dates of applicability
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 <sup>2</sup> or larger in any semiconductor technology node; -stacked die packages with die of 300 mm <sup>2</sup> or larger, or silicon interposers of 300 mm <sup>2</sup> or larger	Applies to categories 1 to 7 and 10 and expires on 21 July 2021
16	Lead in linear incandescent lamps with silicate coated tubes	Expires on 1 September 2013
17	Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications	
18(a)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb)	Expired on 1 January 2011
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 (BaSi2O5:Pb)	-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
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL)	Expires on 1 June 2011

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	Exemption	Scope and dates of applicability
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)	Expires on 1 June 2011
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
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	
26	Lead oxide in the glass envelope of black light blue lamps	Expires on 1 June 2011

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	Exemption	Scope and dates of applicability
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers	Expired on 24 September 2010
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC	-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
30	Cadmium alloys as electrical/mechanical solder joints to electrical 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	-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	

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	Exemption	Scope and dates of applicability
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.
36	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	-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 ( $< 0,2 \mu\text{g Cd per mm}^2$ of display screen area)	-Expires for all categories on 31 October 2019
40	Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment	Expires on 31 December 2013

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	Exemption	Scope and dates of applicability
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 (2))	Expires on 31 December 2018
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 $\geq 15$ 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 applications	Applies to category 11, excluding applications covered by entry 6(c) of this Annex. Expires on 21 July 2024
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.

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	Exemption	Scope and dates of applicability
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 (*1), 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.

Statement:

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Without written approval of CTI, this report can't be reproduced except in full;
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\*\*\* End of Report \*\*\*

## Appendix

### Client Reference Information

JRQ15、JRQ30、JRQ45、JRQ60、JRQ75、JRQ100、JRQ150

### Statement:

The Appendix Information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.