

Test Report No. : ETLRD180531.0081

# RoHS TEST REPORT

European Directive 2011/65/EU

Evaluation of RoHS Requirements for Electrical and Electronic Equipment

**Applicant..... :** MultimediaLink Inc.  
812, 19, Ojeongongoeop-gil, Uiwang-si, Gyeonggi-do, 16072, Republic of Korea

**The following product was submitted and identified on behalf of the applicant as: -**

**Product name..... :** HDMI to USB Capture

**Model(s)..... :** HCP-1080, HCP-1080-A, HCP-1080-B, HCP-1080-C, HCP-1080-D, HCP-1080-E,  
HCP-1080-F, HCP-1080-G

**Date of receipt..... :** May 31, 2018

**Test Period..... :** May 31 ~ Jun 29, 2018

**Date of issue..... :** Jul 04, 2018

**Test method..... :** EN 50581 : 2012, IEC 62321-3-1 : 2013

**Test Result..... :** The product which was evaluated has fulfilled with requirement of Directive 2011/65/EU of the European Parliament on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

**For further details, please refer to the following pages.**

**Tested by :**



Seoul Hee Lee

**Reviewed by :**



Jeong Ryeol Baik

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Note: Documents for the estimation are in additional folder which names Documents, if there is any estimation.

## General description of the product

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### 1. Specification

- 1) Product name..... : HDMI to USB Capture
- 2) Model(s)..... : HCP-1080, HCP-1080-A, HCP-1080-B, HCP-1080-C, HCP-1080-D,  
HCP-1080-E, HCP-1080-F, HCP-1080-G
- 3) Accessory..... : USB Cable
- 4) Manufacturer..... : Same as applicant
- 5) Category of EEE..... : IT and telecommunications equipment
- 6) Tested model..... : HCP-1080
- 7) Difference between models... : The model name differs depending on the buyer.
- 8) Trade mark..... : **mimo**
- 9) Comment..... : N.A.

## General description of the product

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### 2. Photograph



Front view

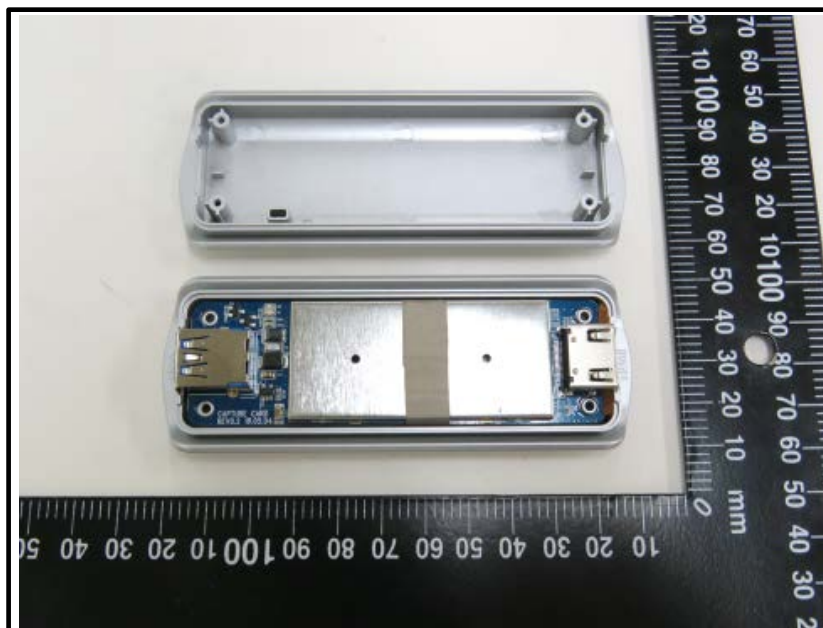


Rear view

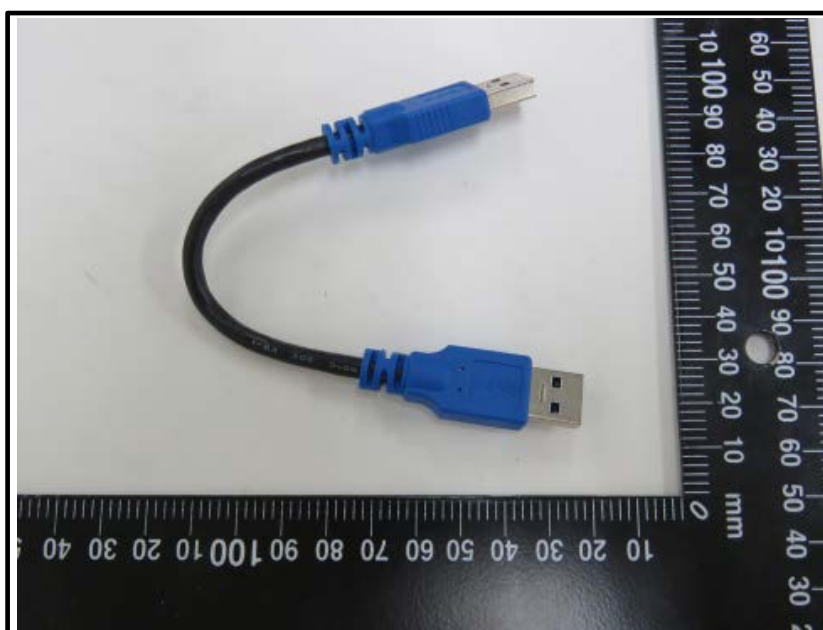
## General description of the product

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### 2. Photograph



Inner view



Accessory view

# Sampling & Test method

## 1. Sampling & Review

Clause	Requirement	Check
1	Sampling	
1.1	Check the components in the product according to partlist submitted by applicant.	<input checked="" type="checkbox"/>
1.2	Select the high risk components.	<input checked="" type="checkbox"/>
1.2.1	Historical likelihood of restricted substances being present in each material type. (e.g. organic substances in metal)	<input checked="" type="checkbox"/>
1.2.2	Historical experience with the supplier organization.	<input checked="" type="checkbox"/>
1.3	Check if the selected component can be mechanically disassembled.	<input checked="" type="checkbox"/>
1.4	Check if the collected samples are sufficient to measure by XRF.	<input checked="" type="checkbox"/>
1.5	Check if the sample is enough to represent the characteristics of population.	<input checked="" type="checkbox"/>
2	Review of the Technical Documents for material, part or sub-assembly.	
2.1	Supplier declarations, confirming that the restricted substance content of the material, part or sub-assembly is within the permitted levels and identifying any exemptions that have been applied.	<input checked="" type="checkbox"/>
2.2	Signed contracts confirming that the manufacturer's specification for the maximum content of restricted substances in a material, part, sub-assembly is fulfilled.	<input checked="" type="checkbox"/>
2.3	Material declarations providing information on specific substance content and identifying any exemptions that have been applied.	<input checked="" type="checkbox"/>
2.4	Analytical test results using the methods described or referenced in IEC 62321 series or EN 62321 series.	<input checked="" type="checkbox"/>

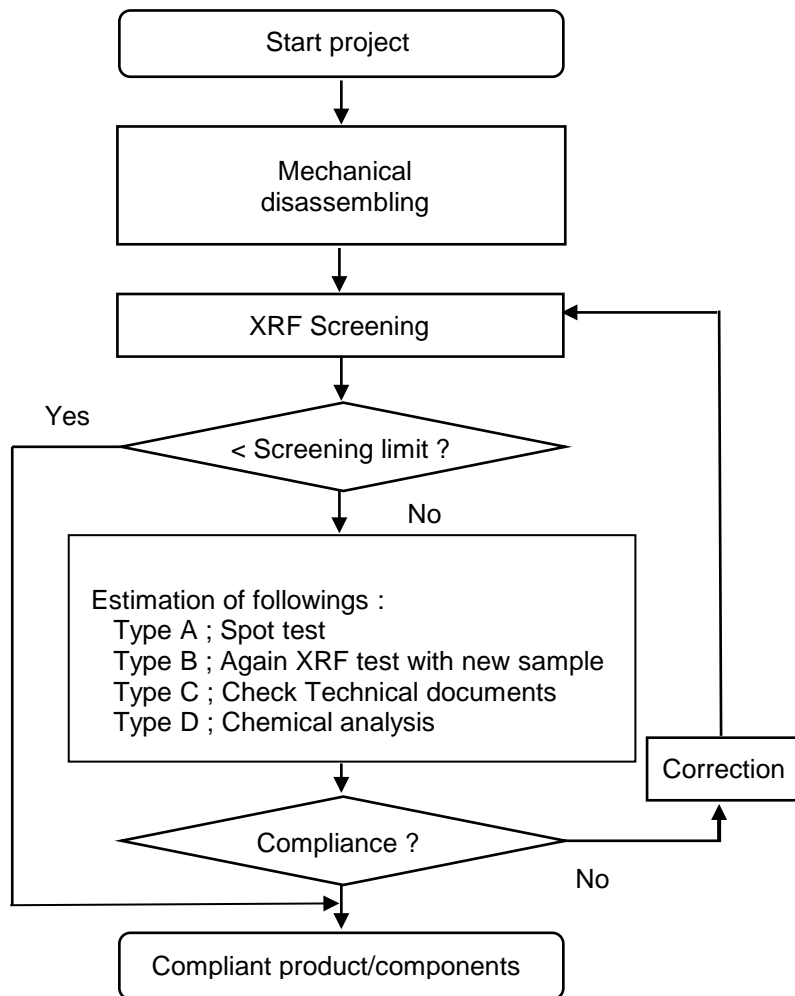
## 2. Test method & Equipment

1) Employed directive..... : 2011/65/EU

2) Test method..... : EN 50581:2012, IEC 62321-3-1:2013

3) Equipment..... : ED-XRF SEA-1000A/Seiko and/or ED-XRF EA-1000AIII/Hitachi

# TEST PROCEDURE

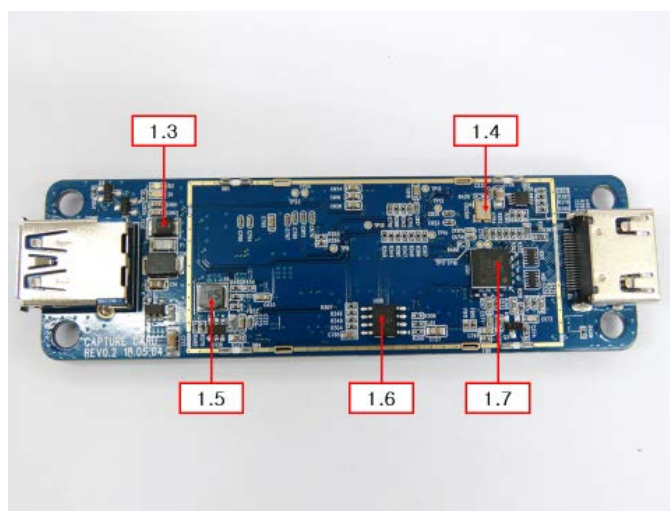
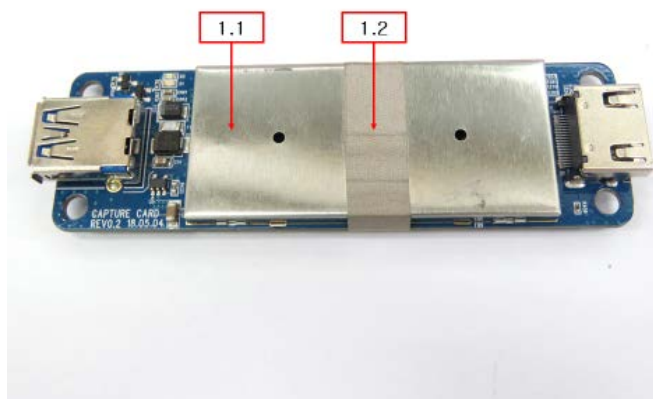


**\* Note:**

- The additional investigation procedures are taken where doubtful test result by XRF screening.
- For maintaining product quality, the comparison and verification are required between analytical test reports and XRF screening results if possible.

## TEST RESULT

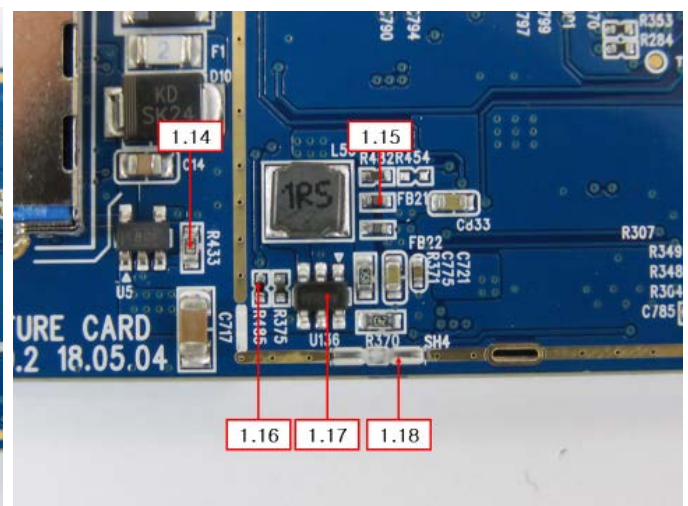
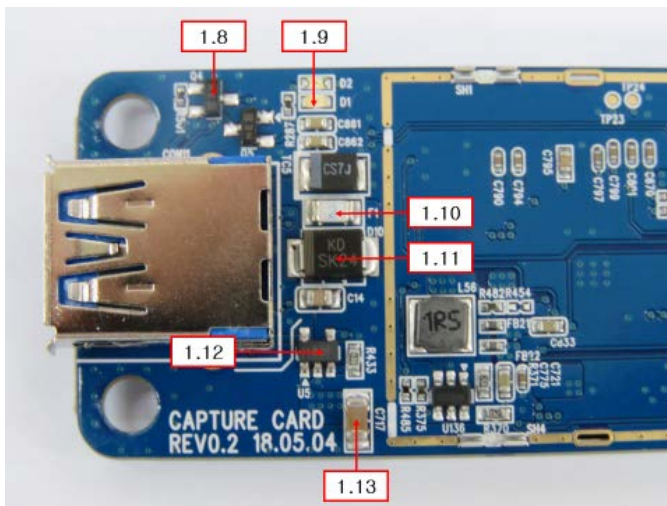
No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
1.1	Shield CAN (60X27)	Shinsung	BL	BL	BL	801	N.A.	Cr - Type A	Pass
1.2	Conductive Tape (ID-NK01)	Doosung	BL	BL	BL	BL	BL	N.A.	Pass
1.3	TACTAL CAP (47uF/10V)	SAMSUNG	BL	BL	BL	BL	BL	N.A.	Pass
1.4	XTAL (27MHZ)	Lihomcrystal	BL	BL	BL	BL	N.A.	N.A.	Pass
1.5	INDUCOR (1.5uH)	Sunlord	BL	BL	BL	BL	N.A.	N.A.	Pass
1.6	IC (24LC032A)	MICROCHIPS	BL	BL	BL	BL	BL	N.A.	Pass
1.7	IC (TC358743SXGB)	TOSHIBA	BL	BL	BL	BL	BL	N.A.	Pass





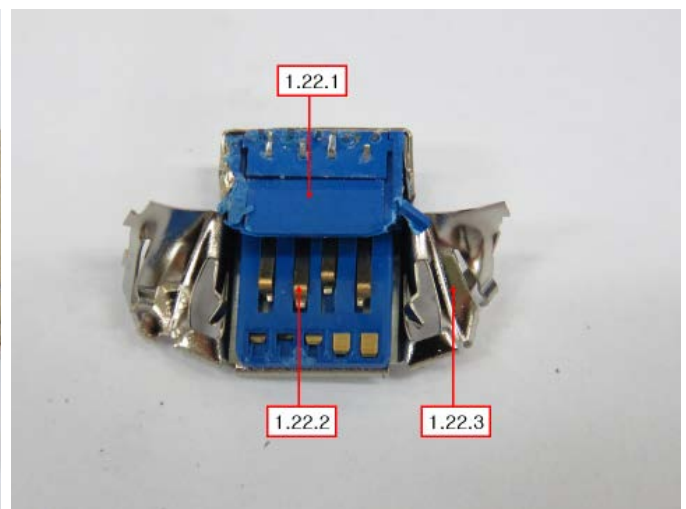
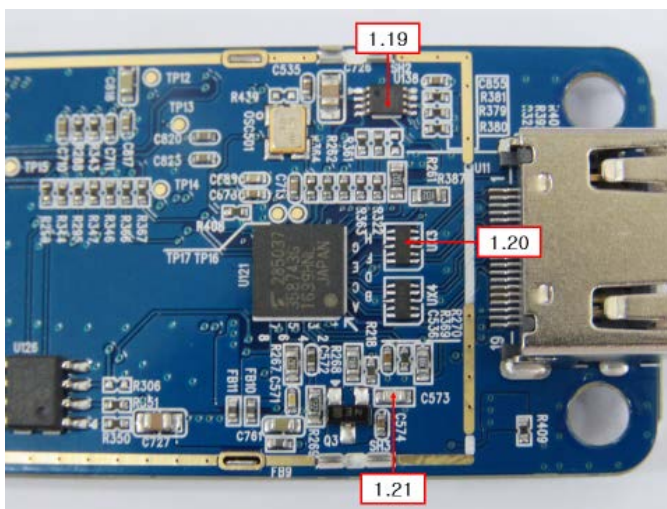
# TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
1.8	TR (KRC105S)	KEC	BL	BL	BL	BL	5493	Br - Type C	Pass
1.9	LED (NB104 (BLUE))	Seoul semi	BL	BL	BL	BL	BL	N.A.	Pass
1.10	FUSE (3216FF2-R (2A))	Bussmann	BL	BL	BL	BL	BL	N.A.	Pass
1.11	DIODE (SS24/SMB)	On Semi	BL	BL	BL	BL	7159	Br - Type C	Pass
1.12	IC (TPS2065D)	TI	BL	BL	BL	BL	BL	N.A.	Pass
1.13	CAP (22uF/10V)	SAMSUNG	BL	BL	BL	BL	BL	N.A.	Pass
1.14	RES (4.99K/1%)	SAMSUNG	BL	BL	BL	821	BL	Cr - Type A	Pass
1.15	FERRITE BEAD (CIC05P121NC)	SAMSUNG	BL	BL	BL	BL	BL	N.A.	Pass
1.16	RES (10K)	SAMSUNG	BL	BL	BL	BL	BL	N.A.	Pass
1.17	IC (EML3172/SOT23-6)	ESMT	BL	BL	BL	BL	BL	N.A.	Pass
1.18	SHIELD CLIP (KIC5210STP)	CST	BL	BL	BL	41352	N.A.	Cr - Type A	Pass



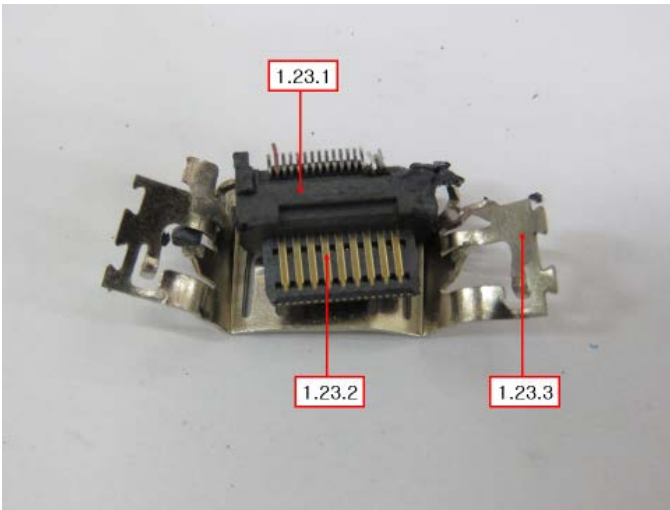
## TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
1.19	IC (PCA9306DCUR)	TI	BL	BL	BL	BL	BL	N.A.	Pass
1.20	TVS DIODE (RClamp0524P)	SEMTECH	BL	BL	BL	BL	BL	N.A.	Pass
1.21	CAP (15pF)	SAMSUNG	BL	BL	BL	BL	BL	N.A.	Pass
1.22.1	CONNECTOR (48405-0003)	MOLEX	BL	BL	BL	BL	51398	Br - Type C	Pass
1.22.2			BL	BL	BL	BL	N.A.	N.A.	Pass
1.22.3			BL	BL	BL	BL	N.A.	N.A.	Pass



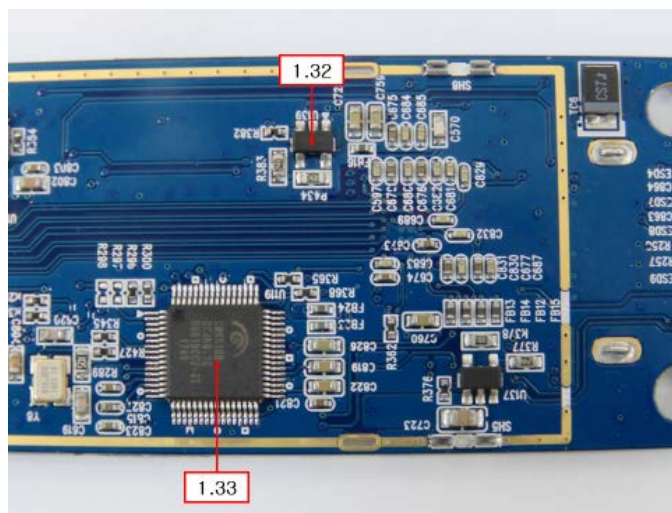
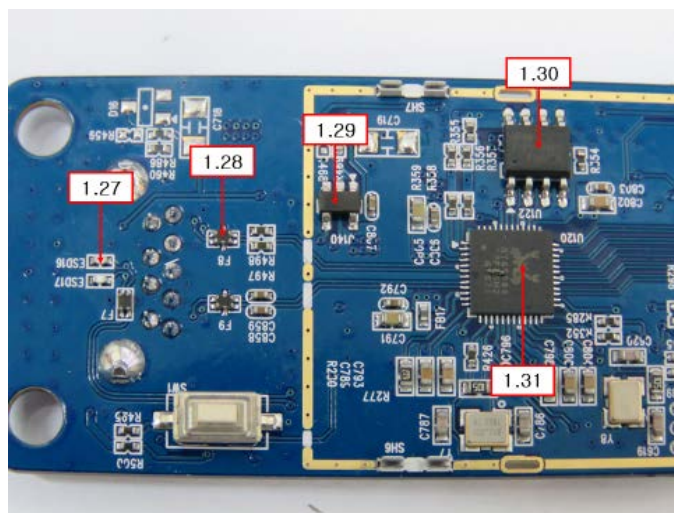
# TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
1.23.1	CONNECTOR (47151-0001)	MOLEX	BL	BL	BL	BL	BL	N.A.	Pass
1.23.2			BL	BL	BL	BL	N.A.	N.A.	Pass
1.23.3			BL	BL	BL	BL	N.A.	N.A.	Pass
1.24	Solder	Ku Ping Enterprise	BL	BL	BL	BL	N.A.	N.A.	Pass
1.25	PCB	CHIKEURRITEU	BL	BL	BL	BL	2241	Br - Type C	Pass
1.26.1	TACT SWITCH (YST-1502)	YS Elec	BL	BL	BL	BL	BL	N.A.	Pass
1.26.2			BL	BL	BL	164816	N.A.	Cr - Type A	Pass



## TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
1.27	ESD (ULCE0505C015FR)	INNOCHIPS	BL	BL	BL	BL	BL	N.A.	Pass
1.28	Filter (ICMEF112P350MFR)	INNOCHIPS	BL	BL	BL	BL	BL	N.A.	Pass
1.29	IC (SN74LVC1G08)	TI	BL	BL	BL	BL	BL	N.A.	Pass
1.30	IC (EN25F10A-104GIP)	EON	BL	BL	BL	BL	BL	N.A.	Pass
1.31	IC (RTS5880)	REALTEK	BL	BL	BL	BL	BL	N.A.	Pass
1.32	IC (EMP8731)	ESMT	BL	BL	BL	BL	BL	N.A.	Pass
1.33	IC (CM6510B)	C-MEDIA	BL	BL	BL	BL	BL	N.A.	Pass



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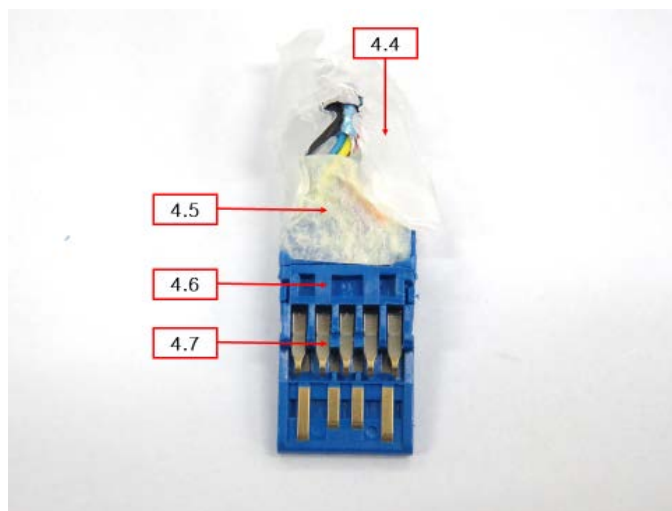
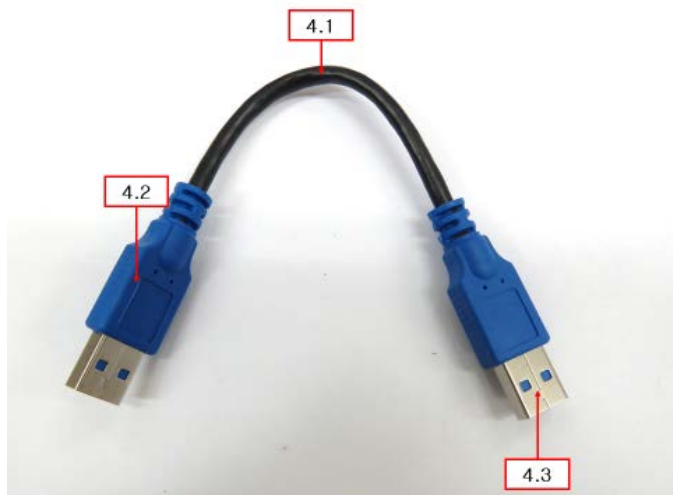
## TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
2.1	Diffuse sheet (128X506)	Kyeongnwon	BL	BL	BL	BL	BL	N.A.	Pass
2.2	CASE TOP Cover (HCP1080TOP)	NE Tech	BL	BL	BL	BL	BL	N.A.	Pass
3	SCREW (TT2X5)	Gana Volt	BL	BL	BL	BL	N.A.	N.A.	Pass



## TEST RESULT

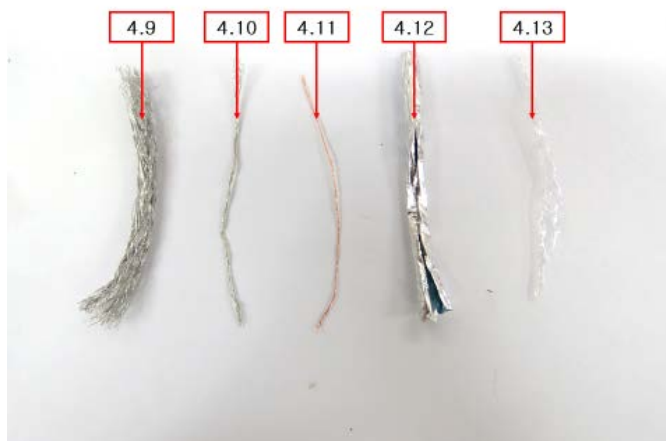
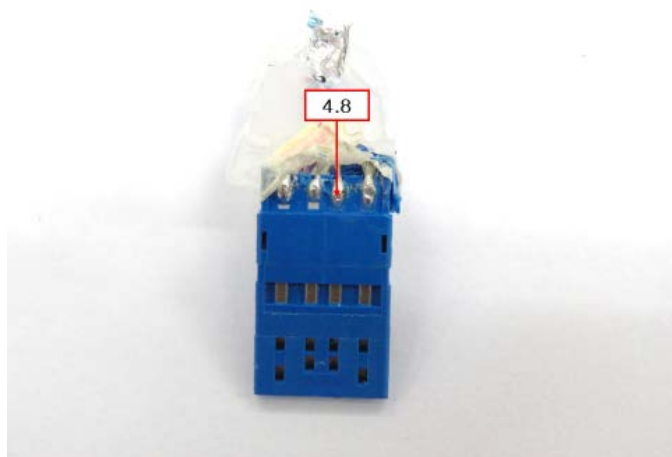
No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
4.1	USB Cable (SU-016C-SS)	Yiwanda	BL	BL	BL	BL	BL	N.A.	Pass
4.2			BL	BL	BL	BL	BL	N.A.	Pass
4.3			BL	BL	BL	BL	N.A.	N.A.	Pass
4.4			BL	BL	BL	BL	BL	N.A.	Pass
4.5			BL	BL	BL	BL	BL	N.A.	Pass
4.6			BL	BL	BL	BL	73678	Br - Type C	Pass
4.7			BL	BL	BL	BL	N.A.	N.A.	Pass





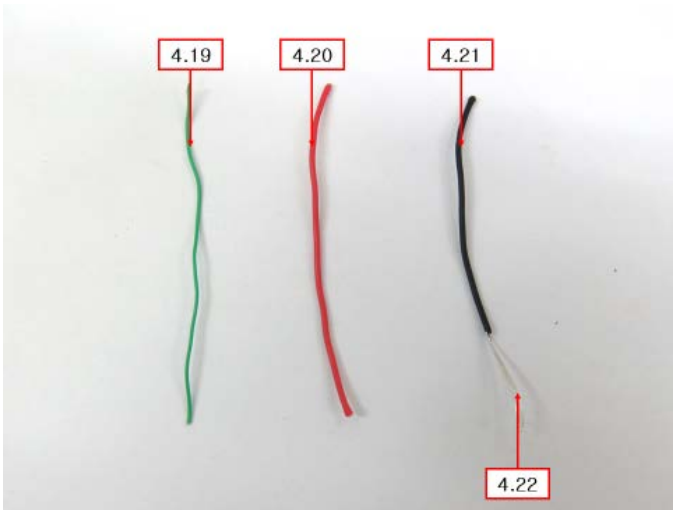
## TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
4.8	USB Cable (SU-016C-SS)	Yiwanda	BL	BL	BL	BL	N.A.	N.A.	Pass
4.9			BL	BL	BL	145790	N.A.	Cr - Type A	Pass
4.10			BL	BL	BL	BL	N.A.	N.A.	Pass
4.11			BL	BL	BL	BL	N.A.	N.A.	Pass
4.12			BL	BL	BL	BL	N.A.	N.A.	Pass
4.13			BL	BL	BL	BL	BL	N.A.	Pass



# TEST RESULT

No.	Part name (Identification)	Supplier	XRF Data (mg/kg)					Estimation	Result
			Cd	Pb	Hg	Cr	Br		
4.14	USB Cable (SU-016C-SS)	Yiwanda	BL	BL	BL	BL	BL	N.A.	Pass
4.15			BL	BL	BL	BL	BL	N.A.	Pass
4.16			BL	BL	BL	BL	BL	N.A.	Pass
4.17			BL	BL	BL	BL	BL	N.A.	Pass
4.18			BL	BL	BL	BL	BL	N.A.	Pass
4.19			BL	BL	BL	BL	BL	N.A.	Pass
4.20			BL	BL	BL	BL	BL	N.A.	Pass
4.21			BL	BL	BL	BL	BL	N.A.	Pass
4.22			BL	BL	BL	BL	N.A.	N.A.	Pass





# Evaluation & Abbreviation

## 1. Evaluation

- 1) Results are obtained by ED XRF in regulated substances according to IEC 62321-3-1:2013.
- 2) While the restricted substances are PBBs, PBDEs and  $Cr^{6+}$ , XRF test result is on total Br or total Cr. Therefore, the additional investigation procedure is needed.
- 3) Screening limits in mg/kg for regulated elements in various matrices.  
(Table A.2 of Annex A to IEC 62321-3-1:2013)

Element	Polymers	Metals	Composite materials
Cd	$BL \leq 57 < X < 143 \leq OL$	$BL \leq 57 < X < 143 \leq OL$	$BL \leq 37 < X < 163 \leq OL$
Pb	$BL \leq 690 < X < 1310 \leq OL$	$BL \leq 690 < X < 1310 \leq OL$	$BL \leq 490 < X < 1510 \leq OL$
Hg	$BL \leq 688 < X < 1312 \leq OL$	$BL \leq 688 < X < 1312 \leq OL$	$BL \leq 488 < X < 1512 \leq OL$
Cr	$BL \leq 666 < X$	$BL \leq 666 < X$	$BL \leq 466 < X$
Br	$BL \leq 276 < X$	N.A.	$BL \leq 226 < X$

- 4) Restricted substances referred to in Article 4(1) of directive 2011/65/EU and maximum concentration values tolerated by weight in homogeneous materials

Cd : 100 mg/kg (0.01 %)

Pb : 1000 mg/kg (0.1 %)

Hg : 1000 mg/kg (0.1 %)

Cr(VI) : 1000 mg/kg (0.1 %)

PBBs : 1000 mg/kg (0.1 %)

PBDEs : 1000 mg/kg (0.1 %)

- 5) Battery and packaging are not subject to directive 2011/65/EU.
  - If battery or packaging is in the product, apply to the related directive.
  - If battery or packaging is measured by XRF, the criteria of XRF result is 'Table A.2 of Annex A to IEC 62321-3-1:2013' (only apply to the data for reference)

## Evaluation & Abbreviation

### 2. Abbreviation

Type A	Detected more than screening limits on total Cr and confirmed the absence of Cr <sup>6+</sup> by diphenylcarbazide reagent.
Type B	Existing sample failed XRF test result and was replaced by new sample to remeasure.
Type C	Detected more than screening limits on total Br and confirmed the absence of PBBs/PBDEs from the technical document.
Type D	The detected material was conducted by chemical analysis.

Cd : Cadmium

N.A. : Not Applicable

Pb : Lead

N.D. : Not Detected

Hg : Mercury

BL : Below limit

Cr : Chromium

OL : Over limit

Cr (VI) : Hexavalent chromium

X : Inconclusive

Br : Bromine

PBBs : Polybrominated biphenyls

PBDEs : Polybrominated diphenyl ethers

## Normative Reference

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### Directive 2011/65/EU

The restriction of the use of certain hazardous substances in electrical and electronic equipment.

### IEC 62321-2 : 2013

Determination of certain substances in electrotechnical product - Part 2: Disassembly, disjointment and mechanical sample preparation.

### IEC 62321-3-1 : 2013

Determination of certain substances in electrotechnical products - Part 3-1 : Screening -Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry.

### IEC/TR 62476 : 2010

Guidance for evaluation of products with respect to substance use restrictions in electrical and electronic products.

### EN 50581 : 2012

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

### EN 62474 : 2012

Material declaration for products of and for the electrotechnical industry.

# ANNEX III to Directive 2011/65/EU

## Application exempted from the restriction in Article 4(1) of Directive 2011/65/EU

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	
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):	
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

# ANNEX III to Directive 2011/65/EU

## Application exempted from the restriction in Article 4(1) of Directive 2011/65/EU

Exemption		Scope and dates of applicability
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	$155$ W $< P \leq 405$ 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
4(c)	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	
4(c)-I	$P \leq 155$ W	No limitation of use until 31 December 2011; 25 mg may be used per burner after 31 December 2011
4(c)-II	$155$ W $< P \leq 405$ W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011
4(c)-III	$P > 405$ 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	
5(a)	Lead in glass of cathode ray tubes	
5(b)	Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	

# ANNEX III to Directive 2011/65/EU

## Application exempted from the restriction in Article 4(1) of Directive 2011/65/EU

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	
6(b)	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	
6(c)	Copper alloy containing up to 4 % lead by weight	
7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)	
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. piezoelectric devices, or in a glass or ceramic matrix compound	
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	
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
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	
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	
9(b)	Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	
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
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	
13(b)	Cadmium and lead in filter glasses and glasses 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

# ANNEX III to Directive 2011/65/EU

## Application exempted from the restriction in Article 4(1) of Directive 2011/65/EU

Exemption		Scope and dates of applicability
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	
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) <sub>2</sub> MgSi <sub>2</sub> O <sub>7</sub> :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 (BaSi <sub>2</sub> O <sub>5</sub> :Pb)	
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
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	
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	
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
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 (1)	
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	

## ANNEX III to Directive 2011/65/EU

### Application exempted from the restriction in Article 4(1) of Directive 2011/65/EU

Exemption		Scope and dates of applicability
33	Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers	
34	Lead in cermet-based trimmer potentiometer elements	
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	
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39	Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm <sup>2</sup> of light-emitting area) for use in solid state illumination or display systems	Expires on 1 July 2014

(<sup>1</sup>) OJ L 326, 29.12.1969, p. 36.



## **ANNEX IV to Directive 2011/65/EU**

### **Application exempted from the restriction in Article 4(1) of Directive 2011/65/EU specific to medical device and monitoring and control instrument**

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Equipment utilising or detecting ionising radiation

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.
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

- 1a. Lead and cadmium in ion selective electrodes including glass of pH electrodes.
- 1b. Lead anodes in electrochemical oxygen sensors.
- 1c. Lead, cadmium and mercury in infra-red light detectors.
- 1d. Mercury in reference electrodes: low chloride mercury chloride, mercury sulphate and mercury oxide.

Others

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 to superconducting materials in MRI and SQUID detectors.
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  $\mu\text{m}$ .
19. Lead in Liquid crystal on silicon (LCoS) displays.
20. Cadmium in X-ray measurement filters.