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**Applicant** : Shanghai HOTO Technology Co., Ltd.

Address : Building 45, No. 50 Moganshan Rd, Putuo District, Shanghai, PRC, 200060.

Sample Name : HOTO Electric Precision Screwdriver Set

: QWLSD010 Style/Item No.

Manufacturer : Shanghai HOTO Technology Co., Ltd.

**Factory** : Dongguan Charles Electrical Technology Co., Ltd.

**Address** : No. 6 Huanggongkeng Road, Tongsha Industrial zone, Dongcheng district,

Dongguan city, 523127, Guangdong province, China

: Jul. 19, 2021 Received Date

**Test Period** : Jul. 19, 2021 ~ Jul. 30, 2021

**Test Requested** : As requested by the client, to evaluate the compliance of the submitted sample

> with EU RoHS Directive 2011/65/EU Annex II and its amendment (EU) 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic

equipment.

**Test Method** 1. Review was performed for the sample and the related Bill of Materials submitted

by the Applicant.

2. a) Refer to the standard IEC 62321-3-1:2013: Screening by XRF

Spectroscopy.

b) Wet chemical test

1) refer to IEC 62321-5:2013, determine the Cadmium, Lead content

by ICP-OES.

2) refer to IEC 62321-4:2013+A1:2017, determine the Mercury content by

ICP-OES.

3) refer to IEC 62321-7-1:2015 & IEC 62321-7-2:2017, determine the

Hexavalent Chromium content by UV-VIS.

4) refer to IEC 62321-6:2015, determine the Polybrominated Biphenyls and

Polybrominated Diphenyl Ethers by GC-MS.

5) refer to IEC 62321-8:2017, determine the Dibutyl phthalate(DBP),

Benzylbutyl phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP) and

Diisobutyl phthalate(DIBP) by GC-MS.

**Test Results** Please refer to next page (s).





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#### Conclusion:

Basing on the test results obtained from the homogenous materials, the submitted sample COMPLIES with the EU RoHS Directive 2011/65/EU Annex II and its amendment (EU) 2015/863.



Signed for and on behalf of UA

EMTEK(Dongguan) Co., Ltd

Prepared by:

Li Huilan Kay

Report Engineer

Reviewed by:

Zhang Hongjing, Carrie

Supervisor

Approved by:

Li Wei, Lisa Authorized signatory Jul. 30, 2021





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#### **Test Results:**

#### 1. Pb, Cd, Hg, Cr<sup>6+</sup>, PBBs, PBDEs Test Results:

No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
4	1 Black coating	Hg	Hg	BL	NA	Pass	No comment
		Cr <sup>6+</sup>	Cr	BL		F 455	No comment
		PBBs PBDEs	Br	BL			
		Pb	Pb	BL			
	2 Silver metal	Cd	Cd	BL			
2		Hg	Hg	BL	NA	Pass	No comment
2	Sliver metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			No comment
	Black hard plastic with brown printing	Cd	Cd	BL			
3		Hg	Hg	BL	NA	Pass	
3		Cr <sup>6+</sup>	Cr	BL	IVA	Fa55	No comment
		PBBs	Br	BL			
		PBDEs	DI	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
4	White hard	Hg	Hg	BL	NA	Pass	No comment
7	plastic	Cr <sup>6+</sup>	Cr	BL	IVA	1 433	140 comment
		PBBs	Br	BL			
		PBDEs		DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
5	Silver metal with	Hg	Hg	BL	NA	Pass	No comment
	grey coating	Cr <sup>6+</sup>	Cr	BL	14/1	Pass	110 001111110111
		PBBs	Br	NA			
		PBDEs		14/1			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			No someont
6	Silver metal	Hg	Hg	BL	NA	Door	
0	Sliver metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	D	NIA			
		PBDEs	Br	NA			
	7 Magnet-silver metal	Pb	Pb	BL			
		Cd	Cd	BL			
7		Hg	Hg	BL	NIA	Door	No some mont
/		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			No comment
	Silver metal	Cd	Cd	BL			
		Hg	Hg	BL	NA	_	
8		Cr <sup>6+</sup>	Cr	BL		Pass	
		PBBs	D	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
9	Silver metal	Hg	Hg	BL	NA	Pass	No comment
9	Silver metar	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
10	Silver metal	Hg	Hg	BL	NA	Pass	No comment
10	Silver Illetat	Cr <sup>6+</sup>	Cr	BL	INA	F d 5 5	NO COMMENT
		PBBs	Dr	NA			
		PBDEs	Br	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			Name
11	Dark silver	Hg	Hg	BL	NA	Dana	
11	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
	12 Dark silver metal	PBBs	Dr	NA			
		PBDEs	Br	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
40		Hg	Hg	BL	NIA	Door	No some mont
12		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			No comment
	Silver metal with	Cd	Cd	BL			
4.0		Hg	Hg	BL	NA	_	
13	black coating	Cr <sup>6+</sup>	Cr	BL		Pass	
		PBBs	D	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
14	Silver metal	Hg	Hg	BL	NA	Pass	No comment
14	Silver metal	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
15	Silver metal	Hg	Hg	BL	NIA	Poss	No comment
15	Silver Metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	NO COMMENT
		PBBs	Dr.	NA			
		PBDEs	Br	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			Name
16	Silver metal with	Hg	Hg	BL	NA	Dana	
16	black coating	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	D	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
	17 Silver metal	Cd	Cd	BL			
47		Hg	Hg	BL	NIA	Door	No some mont
17		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL	NA NA		No comment
	Silver metal with	Cd	Cd	BL		Pass	
40		Hg	Hg	BL			
18	black coating	Cr <sup>6+</sup>	Cr	BL			
		PBBs	D	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
19	Silver metal	Hg	Hg	BL	NA	Pass	No comment
19	Silver metal	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
20	Copper metal	Hg	Hg	BL	NA	Poss	No comment
20	Copper metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr.	NA			
		PBDEs	Br	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	OL			
		Cd	Cd	BL			Coordinate (2)
21	Connor motol	Hg	Hg	BL	Pb:18319	Door	
21	Copper metal	Cr <sup>6+</sup>	Cr	BL	FD.10319	Pass	See remark (3)
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
	22 Silver metal	Cd	Cd	BL			
22		Hg	Hg	BL	NIA	Daga	No somment
22		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
00	Black hard	Hg	Hg	BL	NA	_	
23	plastic	Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	D	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
24	White hard	Hg	Hg	BL	NA	Pass	No comment
24	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	D.	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
25	Black hard	Hg	Hg	BL	NIA	Poss	No comment
25	plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Dr.	BL			
		PBDEs	Br	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
26	Black soft	Hg	Hg	BL	NA	Pass	No servere
20	plastic with grey printing	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL	NIA		
07	Grey hard	Hg	Hg	BL	- NA	Door	No some mont
27	plastic	Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	D.,	V	ND		
		PBDEs	Br	X	ND		
		Pb	Pb	BL	NA		
		Cd	Cd	BL			
20	0	Hg	Hg	BL		Daga	No some mont
28	Green PCB	Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	Br	Х	ND ND		
		PBDEs	ы	^			
		Pb	Pb	BL			
		Cd	Cd	BL			
29	SMD resister	Hg	Hg	BL	NA	Pass	No comment
29	SIVID TESISTEI	Cr <sup>6+</sup>	Cr	BL	INA	F a 5 5	NO COMMENT
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
30	SMD triode	Hg	Hg	BL	NIA	Poss	No comment
30	Sivid thode	Cr <sup>6+</sup>	Cr	BL	NA	Pass	NO COMMENT
		PBBs	Dr	DI			
		PBDEs	Br	BL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	OL			
		Cd	Cd	BL			0
31	SMD diode	Hg	Hg	BL	Pb:21989	Dana	
31	SIMD diode	Cr <sup>6+</sup>	Cr	BL	PD.21969	Pass	See remark (3)
		PBBs	D	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
	32 SMD capacitor	Cd	Cd	BL			
20		Hg	Hg	BL	NIA	Daga	No somment
32		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	BL			
		Pb	Pb	BL			No comment
		Cd	Cd	BL			
00	Disales 22.1	Hg	Hg	BL	NA	_	
33	Black solid	Cr <sup>6+</sup>	Cr	BL		Pass	
		PBBs	D	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
34	SMD IC	Hg	Hg	BL	NA	Pass	No comment
34	SIVID IC	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	D.	BL			
		PBDEs	Br	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
35	SMD resister	Hg	Hg	BL	NA	Pass	No comment
33	SIVID TESISTEL	Cr <sup>6+</sup>	Cr	BL	INA	F d 5 5	NO COMMENT
		PBBs	Dr	BL			
		PBDEs	Br	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
36	Button-copper	Hg	Hg	BL	NA	Dana	
36	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
0.7	Fixed plate-	Hg	Hg	BL	212	D	N
37	silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
	Contact plate- silver metal	Pb	Pb	BL			No comment
		Cd	Cd	BL			
20		Hg	Hg	BL	NA NA	Dana	
30		Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	Br	NA			
		PBDEs	Ы	IVA			
		Pb	Pb	BL			
		Cd	Cd	BL			
39	Black hard	Hg	Hg	BL	NA	Pass	No comment
39	plastic	Cr <sup>6+</sup>	Cr	BL	IVA	rass	NO COMMENT
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
40	Terminal-silver	Hg	Hg	BL	NA	Dace	No comment
40	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	NA			
		PBDEs	וט	11/7			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
41	Black solid	Hg	Hg	BL	NΙΔ	Door	
41	DIACK SOIIU	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Dr	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
	42 Pin-silver metal	Cd	Cd	BL			
40		Hg	Hg	BL	NA	Dana	No some mont
42		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
	43 SMD diode	Pb	Pb	OL	Pb:22569		See remark (3)
		Cd	Cd	BL		Pass	
40		Hg	Hg	BL			
43		Cr <sup>6+</sup>	Cr	BL		Pass	See remark (3)
		PBBs	2	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
44	Beige hard	Hg	Hg	BL	NA	Pass	No comment
44	plastic	Cr <sup>6+</sup>	Cr	BL	NA .	Fa55	No comment
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
45	Pin-silver metal	Hg	Hg	BL	NΙΛ	Poor	No comment
40	riii-siivei iiietal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	NO COMMENT
		PBBs	D <sub>r</sub>	NA			
		PBDEs	Br	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			Noncomment
40	Cibrar mastal	Hg	Hg	BL	NA	Pass	
46	Silver metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
47	Solder-silver	Hg	Hg	BL	212	D	None
47	metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
	48 Green PCB	Pb	Pb	BL			
		Cd	Cd	BL	210		
40		Hg	Hg	BL	NA ND ND	Descri	None
48		Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	2	V			
		PBDEs	Br	X			
		Pb	Pb	BL			
		Cd	Cd	BL			
49	SMD LED	Hg	Hg	BL	NA	Pass	No comment
49	SIVID LED	Cr <sup>6+</sup>	Cr	BL	INA	F 455	No comment
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
50	Shell-silver	Hg	Hg	BL	NA	Page	No comment
30	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	NA			
		PBDEs	וט	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
51	Pin-silver metal	Hg	Hg	BL	NA	Door	No comment
31	with gold plating	Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	De	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
	52 Black hard plastic	Cd	Cd	BL			
50		Hg	Hg	BL	212	D	No
52		Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	BL			
	53 SMD diode	Pb	Pb	OL			See remark (3)
		Cd	Cd	BL		Pass	
		Hg	Hg	BL	Pb:22426		
53		Cr <sup>6+</sup>	Cr	BL			See remark (3)
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
54	SMD resister	Hg	Hg	BL	NA	Pass	No comment
54	SIVID TESISIEI	Cr <sup>6+</sup>	Cr	BL	INA	F a 5 5	No comment
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
55	SMD conscitor	Hg	Hg	BL	NΙΔ	Poss	No comment
55	SMD capacitor	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	D.	BL			
		PBDEs	Br	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
56	Beige hard	Hg	Hg	BL	NA	Dana	
36	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
<b>5</b> 7	Die ailvermatel	Hg	Hg	BL	NIA	Daga	No some mont
57	Pin-silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
	58 Red paperboard	Pb	Pb	BL			No comment
		Cd	Cd	BL		Pass	
50		Hg	Hg	BL	NA		
58		Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	2	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
59	Yellow transparent soft	Hg	Hg	BL	NA	Pass	No comment
59	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
60	White paper	Hg	Hg	BL	NA	Page	No comment
00	with glue	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	BL			
		PBDEs	וט	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
61	Green insulation	Hg	Hg	BL	NΙΔ	Door	No comment
01	paper	Cr <sup>6+</sup>	Cr	BL	NA	Pass	
		PBBs	De	D			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
00	0.7	Hg	Hg	BL	212	D	No
62	Silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
63	Silver metal with	Hg	Hg	BL	NA	Pass	No comment
03	black printing	Cr <sup>6+</sup>	Cr	BL	INA	Fa55	No comment
		PBBs	Br	NA			
		PBDEs	ы	IVA			
		Pb	Pb	BL			
		Cd	Cd	BL			
64	Solder-silver	Hg	Hg	BL	NA	Pass	No comment
04	metal	Cr <sup>6+</sup>	Cr	BL	INA	F 455	No comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL	NA		
65	Plug-white hard	Hg	Hg	BL	INA	Pass	No commont
00	plastic	Cr <sup>6+</sup>	Cr	BL		F d 5 5	No comment
		PBBs	Br	Х	ND		
		PBDEs	וט	^	ND		





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
66	Plug-pin-silver	Hg	Hg	BL	NA	Door	No comment
00	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
07	Electric wire-	Hg	Hg	BL	212	D	No
67	black soft plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	BL			
		Pb	Pb	BL			No comment
		Cd	Cd	BL			
68	Electric wire-red	Hg	Hg	BL	NA	Doos	
00	soft plastic	Cr <sup>6+</sup>	Cr	BL	INA	Pass	
		PBBs	Br	BL			
		PBDEs	Ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
69	Electric wire-	Hg	Hg	BL	NA	Pass	No comment
09	silver metal	Cr <sup>6+</sup>	Cr	BL	INA	F 455	No comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
70	Magnet-grey	Hg	Hg	BL	NA	Dage	No commont
/0	solid	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	BL			
		PBDEs	וט	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
71	Connor motol	Hg	Hg	BL	NIA	Door	No comment
/ 1	Copper metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
70	Cib	Hg	Hg	BL	NIA	Dana	No some sut
72	Silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
70	0.1	Hg	Hg	BL		_	
73	Silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs					
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
74	Connor motol	Hg	Hg	BL	NA	Door	No comment
/4	Copper metal	Cr <sup>6+</sup>	Cr	BL	I INA	Pass	No comment
		PBBs	D.	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
75	Black soft	Hg	Hg	BL	NIA	Poss	No comment
/5	plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	NO COMMENT
		PBBs	Dr.	BL			
		PBDEs	Br	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
76	Black hard	Hg	Hg	BL	NA	Pass	No comment
76	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
77	Cibrar mastal	Hg	Hg	BL	NIA	Dana	No some mont
77	Silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
78	Conner metal	Hg	Hg	BL	NA	Doos	No comment
/0	Copper metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	NA			
		PBDEs	Ы	IVA			
		Pb	Pb	BL			
		Cd	Cd	BL			
79	Yellow hard	Hg	Hg	BL	NA	Pass	No comment
19	plastic	Cr <sup>6+</sup>	Cr	BL	IVA	rass	NO COMMENT
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
80	Silver metal	Hg	Hg	BL	NA	Dage	No comment
00	Silver Illetai	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	NA			
		PBDEs	וט	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
81	Solder-silver	Hg	Hg	BL	NA	Pass	No comment
01	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
00	Disalessie	Hg	Hg	BL	NIA	Dana	No some mont
82	Black solid	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
00	Dod hord plactic	Hg	Hg	BL	NIA	Door	No comment
83	Red hard plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Br	BL			
		PBDEs	Ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
84	Silver metal	Hg	Hg	BL	NA	Pass	No comment
04	Silver metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	D.	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
0.5	White hard	Hg	Hg	BL	NΙΔ	Door	No commont
85	plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Br	BL			
		PBDEs	Ы	DL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
86	Silver metal	Hg	Hg	BL	NA	Pass	No comment
00	Silver metai	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
87	Black soft	Hg	Hg	BL	NA	Door	No commont
07	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
00	Black soft	Hg	Hg	BL	NIA	D	No some sof
88	plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Br	BL			
		PBDEs	DI	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
89	Black soft	Hg	Hg	BL	NA	Pass	No comment
09	plastic	Cr <sup>6+</sup>	Cr	BL	INA	F a 5 5	No comment
		PBBs	Br	BL			
		PBDEs	Ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
90	Silver metal	Hg	Hg	BL	NA	Page	No comment
90	Silver Illetat	Cr <sup>6+</sup>	Cr	BL	INA	Pass	NO COMMENT
		PBBs	Br	NA	7		
		PBDEs	וט	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
91	Silver metal with	Hg	Hg	BL	NΙΔ	Door	No some mont
91	gold plating	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	Dr	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
00	Black hard	Hg	Hg	BL	110	D	No
92	plastic	Cr <sup>6+</sup>	Cr BL NA	NA	Pass	No comment	
		PBBs PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL	NA		
00	Creen DCD	Hg	Hg	BL	NA	Door	No comment
93	Green PCB	Cr <sup>6+</sup>	Cr	BL		Pass	No comment
		PBBs	Br	Х	ND		
		PBDEs	Ы	^	ND		
		Pb	Pb	BL			
		Cd	Cd	BL			
94	Solder-silver	Hg	Hg	BL	NA	Pass	No comment
94	metal	Cr <sup>6+</sup>	Cr	BL	NA .	F 455	NO Comment
		PBBs	Br	NA			
		PBDEs	ы	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
95	SMD register	Hg	Hg	BL	NΙΛ	Poos	No commont
95	SMD resister	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	D.	DI			
		PBDEs	Br	BL			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
96	White hard	Hg	Hg	BL	NA	Pass	No comment
96	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
97	Black soft	Hg	Hg	BL	NA	Door	No comment
97	plastic	Cr <sup>6+</sup>	Cr	BL	INA	Pass	No comment
		PBBs Br BL					
		Pb	Pb	BL			No comment
		Cd	Cd	BL			
00	0.7	Hg	Hg	BL	NIA	D	
98	Silver metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	
		PBBs	D.	NIA			
		PBDEs	Br	NA			
		Pb	Pb	BL			
		Cd	Cd	BL			
99	Silver metal with	Hg	Hg	BL	NA	Pass	No comment
99	gold plating	Cr <sup>6+</sup>	Cr	BL	INA	F488	No comment
		PBBs	D.	NA			
		PBDEs	Br	INA			
		Pb	Pb	BL			
		Cd	Cd	BL			
100	Solder-silver	Hg	Hg	BL	NA	Poos	No comment
100	metal	Cr <sup>6+</sup>	Cr	BL	INA	Pass	NO COMMENT
		PBBs	D <sub>r</sub>	NA			
		PBDEs	Br	INA			





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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF <sup>(1)</sup>	Results of Chemical Testing <sup>(2)</sup> (mg/kg)	Conclusion	Remark
		Pb	Pb	BL			
		Cd	Cd	BL			
101	Black hard	Hg	Hg	BL	NA	Door	No comment
101	plastic	Cr <sup>6+</sup>	Cr	BL	NA .	Pass	
		PBBs	Br	BL			
		PBDEs	ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
400	Translucent	Hg	Hg	BL	210	D	No some sof
102	hard plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs Br	Br	BL			
		Pb	Pb	BL			
	Electric wire-red	Cd	Cd	BL			
103		Hg	Hg	BL	NIA	Pass	No comment
103	soft plastic	Cr <sup>6+</sup>	Cr	BL	NA	1 433	No comment
		PBBs	Br	BL			
		PBDEs	Ы	DL			
		Pb	Pb	BL			
		Cd	Cd	BL			
104	Electric wire-	Hg	Hg	BL	NA	Pass	No comment
104	black soft plastic	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	D.	DI			
		PBDEs	Br	BL			
		Pb	Pb	BL			
		Cd	Cd	BL			
105	Electric wire-	Hg	Hg	BL	NΙΔ	Door	No commont
105	copper metal	Cr <sup>6+</sup>	Cr	BL	NA	Pass	No comment
		PBBs	D.	NΙΛ			
		PBDEs	Br	NA			





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#### **Test Results:**

#### 2. Phthalates (DBP, BBP, DEHP, DIBP) Test Results:

Test Item		Test Resu	ult (mg/kg)		MDL (mg/kg)	Requirement	
rest item	1/3/4	23/24/25	26/27/28	29/30/31	MDE (mg/kg)	Limit (mg/kg)	
Dibutyl phthalate(DBP)	ND	ND	ND	ND	30	1000	
Benzylbutyl phthalate(BBP)	ND	ND	ND	ND	30	1000	
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	ND	30	1000	
Diisobutyl phthalate(DIBP)	ND	ND	ND	ND	30	1000	
Conclusion	Pass	Pass	Pass	Pass			

Test Item		Test Resu	MDL (mg/kg)	Requirement			
rest item	32/33/34	35/39/41	43/44/48	49/52/53	MDE (mg/kg)	Limit (mg/kg)	
Dibutyl phthalate(DBP)	ND	ND	ND	ND	30	1000	
Benzylbutyl phthalate(BBP)	ND	ND	ND	ND	30	1000	
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	ND	30	1000	
Diisobutyl phthalate(DIBP)	ND	ND	ND	ND	30	1000	
Conclusion	Pass	Pass	Pass	Pass			

Test Item		Test Resu	MDL (mg/kg)	Requirement		
rest item	54/55/56	58/59/60	61/65/67	68/70/75	MDE (mg/kg)	Limit (mg/kg)
Dibutyl phthalate(DBP)	ND	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	Pass		

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement	
Test item	76/79/82	83/85/87	88/89/92	93/95/96	MDE (mg/kg)	Limit (mg/kg)
Dibutyl phthalate(DBP)	ND	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	Pass		





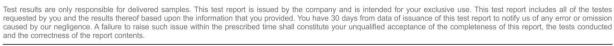
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#### **Test Results:**

Test Item	Test Resu	MDL (mg/kg)	Requirement	
rest item	97/101/102	103/104	MDE (mg/kg)	Limit (mg/kg)
Dibutyl phthalate(DBP)	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	30	1000
Conclusion	Pass	Pass		

Note: mg/kg = parts per million = ppm

ND = Not Detected (less than reporting limit)







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#### **Test Materials List:**

Item No.	Description			
1	Black coating			
3	Black hard plastic with brown printing			
4	White hard plastic			
23	Black hard plastic			
24	White hard plastic			
25	Black hard plastic			
26	Black soft plastic with grey printing			
27	Grey hard plastic			
28	Green PCB			
29	SMD resister			
30	SMD triode			
31	SMD diode			
32	SMD capacitor			
33	Black solid			
34	SMD IC			
35	SMD resister			
39	Black hard plastic			
41	Black solid			
43	SMD diode			
44	Beige hard plastic			
48	Green PCB			
49	SMD LED			
52	Black hard plastic			
53	SMD diode			
54	SMD resister			
55	SMD capacitor			
56	Beige hard plastic			
58	Red paperboard			
59	Yellow transparent soft plastic			

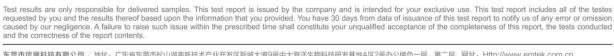




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Item No.	Description			
60	White paper with glue			
61	Green insulation paper			
65	Plug-white hard plastic			
67	Electric wire-black soft plastic			
68	Electric wire-red soft plastic			
70	Magnet-grey solid			
75	Black soft plastic			
76	Black hard plastic			
79	Yellow hard plastic			
82	Black solid			
83	Red hard plastic			
85	White hard plastic			
87	Black soft plastic			
88	Black soft plastic			
89	Black soft plastic			
92	Black hard plastic			
93	Green PCB			
95	SMD resister			
96	White hard plastic			
97	Black soft plastic			
101	Black hard plastic			
102	Translucent hard plastic			
103	Electric wire-red soft plastic			
104	Electric wire-black soft plastic			

Note: As specified by the client, the samples were subjected to mixed testing.







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- Remark: (1) ① Results are obtained by XRF for primary screening, and further wet chemical testing by ICP-OES / AAS (for Cd, Pb, Hg), UV-VIS (for Cr(VI)) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if an inconclusive result was found (as "X" in below table) (unit: mg/kg).
  - ② OL = Over Limit, BL = Below Limit, X = Inconclusive, NA= Not Applicable.
  - ③ XRF screening test for RoHS elements The test result may be different from the actual content in the non-uniformity composition sample.

Element	Polymer	Metal	Composite Materials	
Cd	$BL \leqslant (70\text{-}3\sigma) < X < (130\text{+}3\sigma) \leqslant OL$	BL ≤(70-3 \( \sigma \) < X <(130+3 \( \sigma \) ≤ OL	LOD < X <(150+3 <i>σ</i> )≤ OL	
Pb	$BL \leq (700-3 \sigma) < X < (1300+3 \sigma)$ $\leq OL$	$BL \leq (700-3 \sigma) < X < (1300+3 \sigma)$ $\leq OL$	$BL \leq (500-3 \sigma) < X < (1500+3 \sigma)$ $\leq OL$	
Hg	BL ≤(700-3 \( \sigma \)) < X <(1300+3 \( \sigma \)) ≤ OL	BL ≤(700-3 \(\sigma\)) < X <(1300+3 \(\sigma\)) ≤ OL	BL ≤(500-3 \( \sigma \) < X <(1500+3 \( \sigma \) ) ≤ OL	
Br	BL ≤ (300-3 <i>σ</i> )< X	NA	BL ≤ (250-3 <i>σ</i> )< X	
Cr	BL ≤ (700-3 <i>σ</i> )< X	BL ≤ (700-3 <i>σ</i> )< X	BL ≤ (500-3 <i>σ</i> )< X	

- (2) ① mg/kg = ppm = 0.0001%, ND = Not Detected (less than MDL), MDL = Method Detection Limit.
  - 2 Unit, Reporting Limit (RL) and Requirement limit in wet chemical test.

Test items	Pb	Cd	Hg	Cr <sup>6+</sup> (Non-metal)	Cr <sup>6+</sup> (metal)	PBBs(single)	PBDEs(single)
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
RL	2	2	2	8		5	5
Requirement Limit	1000	100	1000	1000	Negative	1000	1000

- 3 According to IEC 62321-7-1:2015 & IEC 62321-7-2:2017, result on Cr<sup>6+</sup> for metal sample shall be shown as Positive/Negative.
  - a) The Cr(VI) concentration is more than 0.13 μg/cm², the sample is positive for Cr(VI), the coating is considered to contain Cr(VI).
  - b) The Cr(VI) concentration is less than 0.10 μg/cm², the sample is negative for Cr(VI), the coating is considered a non-Cr(VI) based coating.

Storage condition and production date of the tested sample are unavailable and thus results of  $Cr^{6+}$  represent status of the sample at the time of testing.

- According to IEC 62321-3-1:2013, this column represents the results of wet chem test. And "NA" means no need to perform wet chem test, when the XRF screening results are acceptable.
- (3) As declared by the client, No.21 the material should be exempted for lead content requirement according to Annex clause 6(c); No.31, 43, 53 the material should be exempted for lead content requirement according to Annex clause 7(a).





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#### Sample Photo

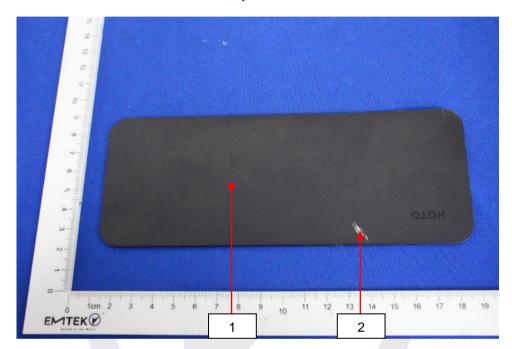






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#### Sample Photo



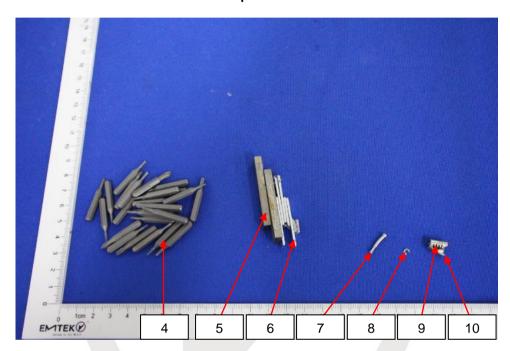


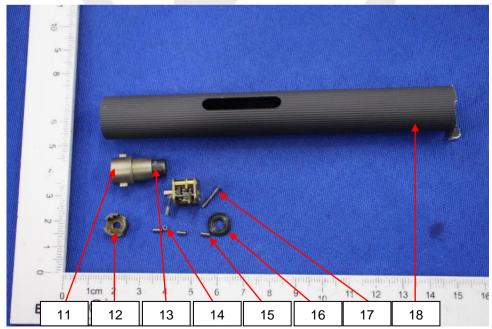




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#### Sample Photo



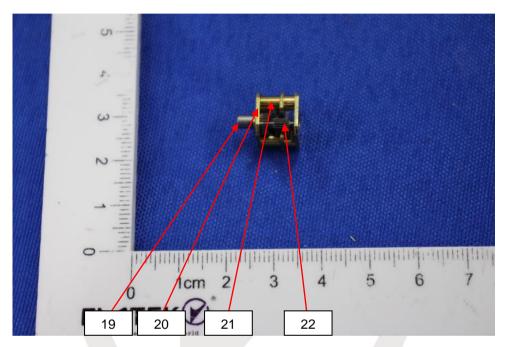






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#### Sample Photo



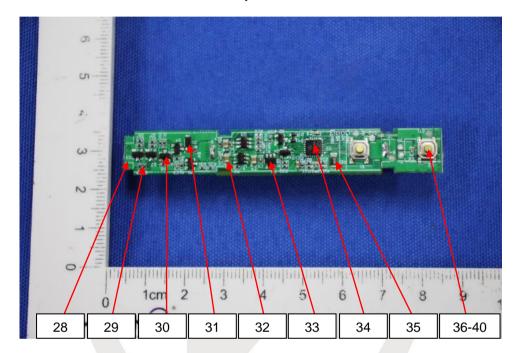


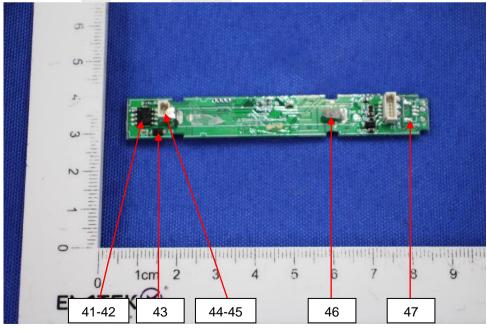




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#### Sample Photo



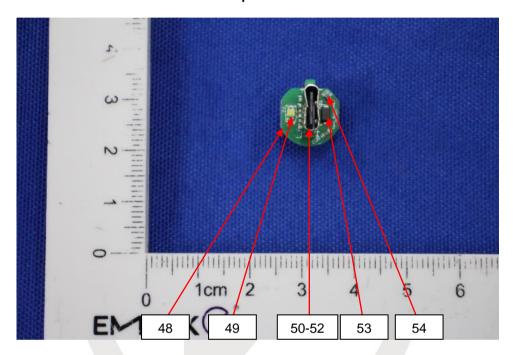


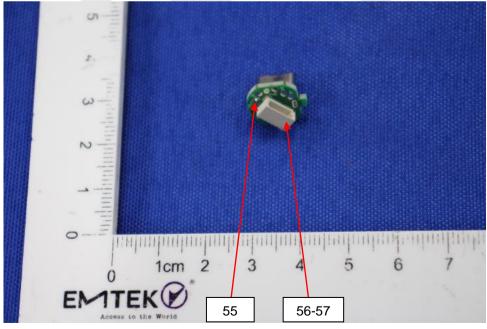




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#### Sample Photo



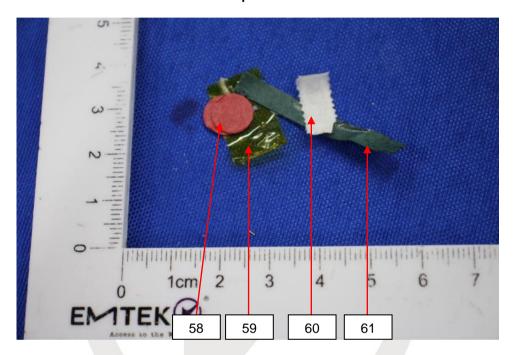


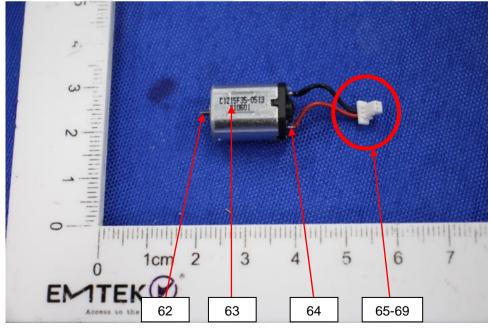




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#### Sample Photo



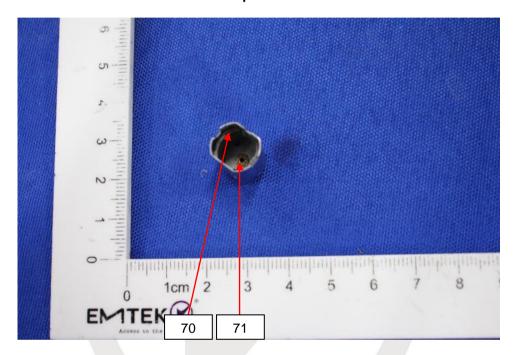


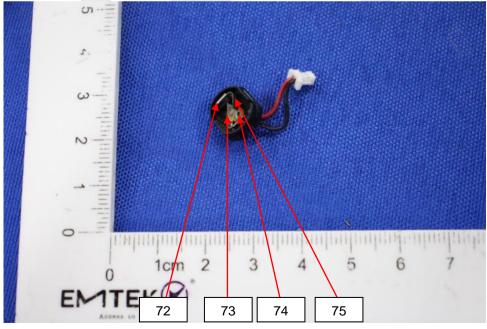




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#### Sample Photo



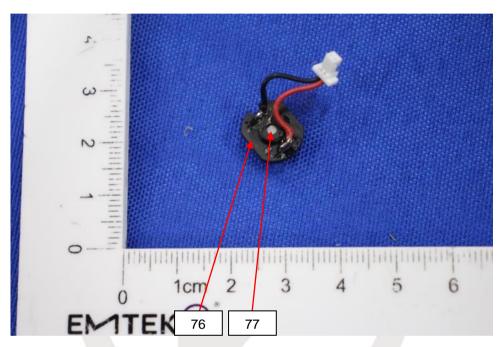


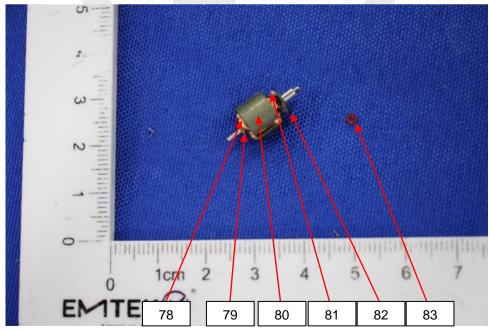




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#### Sample Photo



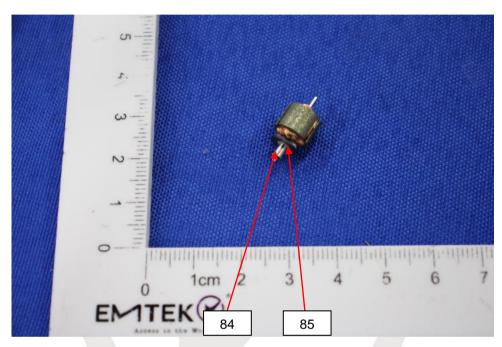


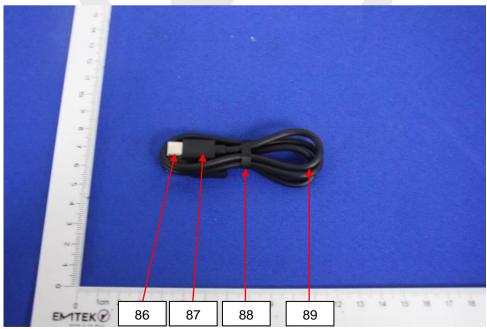




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#### Sample Photo



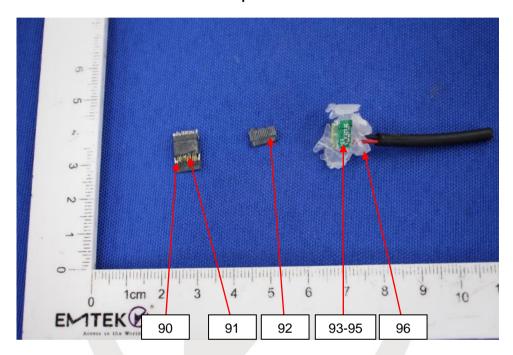


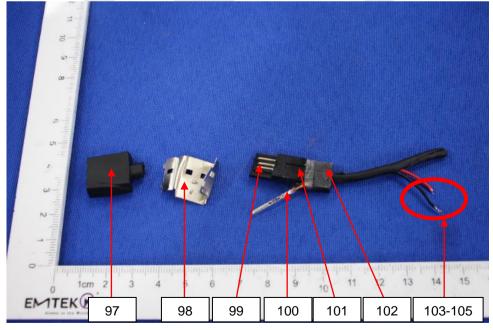




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#### Sample Photo





#### \*\*\* End of Report \*\*\*





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#### **ANNEX**

#### **EXEMPTION LIST**

- Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):
- 1(a) For general lighting purposes < 30W: 5mg (expires on 31 December 2011; 3.5mg may be used per burner after 31 December 2011 until 31 December 2012; 2.5mg shall be used per burner after 31 December 2012)
- 1(b) For general lighting purposes ≥ 30W and <50W: 5mg (expires on 31 December 2011; 3.5mg may be used per burner after 31 December 2011)
- 1(c) For general lighting purposes ≥ 50W and <150W: 5mg
- 1(d) For general lighting purposes ≥ 150W: 15mg
- 1(e) For general lighting purposes with circular or square structural shape and tube diameter ≤17mm (no limitation of use until 31 December 2011; 7mg may be used per burner after 31 December 2011)
- 1(f) For special purposes: 5mg
- 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 purples not exceeding (per lamp):
- 2(a)(1) Tri-band phosphor with normal lifetime and a tube diameter < 9mm (e.g. T2): 5mg (expires on 31 December 2011; 4mg may be used per lamp after 31 December 2011)
- 2(a)(2) Tri-band phosphor with normal lifetime and a tube diameter ≥ 9mm and ≤ 17mm (e.g. T5): 5mg (expires on 31 December 2011; 3mg may be used per lamp after 31 December 2011)
- 2(a)(3) Tri-band phosphor with normal lifetime and a tube diameter > 17mm and ≤ 28mm (e.g. T8): 5mg (expires on 31 December 2011; 3.5mg may be used per lamp after 31 December 2011)
- 2(a)(4) Tri-band phosphor with normal lifetime and a tube diameter > 28mm (e.g. T12): 5mg (expires on 31 December 2012; 3.5mg may be used per lamp after 31 December 2012)
- 2(a)(5) Tri-band phosphor with long lifetime (≥ 25000h): 8mg (expires on 31 December 2011; 5mg may be used per lamp after 31 December 2011)
- 2(b) Mercury in other fluorescent lamps not exceeding (per lamp):
- 2(b)(2) Non-linear halophosphate lamps (all diameters): 15mg (expires on 13 April 2016)
- 2(b)(3) Non-linear tri-band phosphor lamps with tube diameter > 17mm (e.g. T9) (no limitation of use until 31 December 2011; 15mg 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; 15mg may be used per lamp after 31 December 2011)
- 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 (≤ 500mm) (No limitation of use until 31 December 2011; 3.5mg may be used per lamp after 31 December 2011)
- 3(b) Medium length (> 500m and ≤ 1500mm) (No limitation of use until 31 December 2011; 5mg may be used per lamp after 31 December 2011)
- 3(c) Long length (> 1500mm) (No limitation of use until 31 December 2011; 13mg 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; 15mg 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 Ra > 60:
- 4(b)-l P ≤ 155W (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
- 4(b)-II 155W < P ≤ 405W (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
- 4(b)-III P > 405W (no limitation of use until 31 December 2011; 40mg 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≤ 155W (no limitation of use until 31 December 2011; 25mg may be used per burner after 31 December 2011)
- 4(c)-II 155W < P ≤405W (no limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011)
- 4(c)-III P > 405W (no limitation of use until 31 December 2011; 40mg 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: (Expires on 31 December 2018)
  - (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.





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#### **ANNEX**

#### **EXEMPTION LIST**

#### Continued

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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- 6(a) Lead as an alloying element in steel for machining purposes and in galvanized 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. piezoelectronic devices, or in a glass or ceramic matrix compound
- 7(c)-II Lead in dielectric ceramic in capacitors for a rated voltage of 125V AC or 250V DC or higher
- 7(c)-III Lead in dielectric ceramic in capacitors for a rated voltage of less than 125V AC or 250V 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
- 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
- 8(b)-I Cadmium and its compounds in electrical contacts used in:
  - Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
  - 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.
- 9 Hexavalent chromium as an anti-corrosion 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(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)
- 13(a) Lead in white glasses used for optical applications
- 13(b) Cadmium and lead in filter glasses and glasses used for reflectance standards
- 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 (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)
- Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
- 17 Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications
- 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)
- Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glass
- Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
- Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring
- Lead bound in crystal glass as defined in Annex 1 (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
- 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





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#### **ANNEX**

#### **EXEMPTION LIST**

#### Continued

- 31 Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial
- 32 Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
- 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
- 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
- Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm2 of light- emitting area) for use in solid state illumination or display systems (expires on 1 July 2014)
- Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition 41 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)
- 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 concentration value of bis(2-ethylhexyl) phthalate does not exceed:
  - 30% by weight of the rubber for
    - gasket coatings;
    - 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.
  - 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.
- 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.





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