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Report No.: LCS190322084AR

TEST REPORT

Client company Fulton Science and Technology Lighting Co., Ltd

7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Client address

Gongming, Guangming New District, Shenzhen, Guangdong Province, China.

Fulton Science and Technology Lighting Co., Ltd Manufacturer

7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Address

Gongming, Guangming New District, Shenzhen, Guangdong Province, China.

Report on the submitted samples said to be:

LED Tri-proof light Sample Name

Trade Mark Fulton

Test Item No. FLT-TP-120L24

FLT-TP-20L6, FLT-TP-30L6, FLT-TP-50L12, FLT-TP-60L12, Style/ Item No.

FLT-TP-80L15, FLT-TP-80L18, FLT-TP-100L18, FLT-TP-100L24

Sample Receiving Date April 11, 2019

Testing Period April 11, 2019 ~ May 10, 2019

Results Please refer to next page(s).

Summary of Test Results:

TEST REQUEST

According to the customer's request, based on the performed tests on submitted sample, the results of lead(Pb), mercury(Hg), cadmium(Cd), hexavalent chromium(Cr⁶⁺),polybrominated biphenyls(PBBs), polybrominated diphenyl(PBDEs), (BBP), (DBP), (DEHP), (DIBP), comply with the limits as set by EU RoHS Directive 2011/65/EU and its amendment Directive 2015/863/EU

Signed for and on behalf of LCS

Written By

Checked by:

Approved by



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Results:

A. EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

0				R	esults			Date of
Seq. No.	Tested Part(s)	Cd	Pb	Hg	Cr(Cr ⁶⁺) [▼]	В	r [▼]	sample submission/r
		Cu	FD	119	CI(CI)	PBBs	PBDEs	esubmission
1	Transparent plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
2	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
3	Tin solder	BL	BL	BL	BL	/	/	2019-04-14
4	White plastic linen	BL	BL	BL	BL	BL	BL	2019-04-14
5	Silver wire	BL	BL	BL	BL	/	/	2019-04-14
6	Yellow LED	BL	BL	BL	BL	BL	BL	2019-04-14
7	PCB board	BL	BL	BL	BL	Х	Х	2019-04-14
8	Silver metal sheet	BL	BL	BL	BL	/	/	2019-04-14
9	Ferrous metal screw	BL	BL	BL	Х	/	/	2019-04-14
10	White plastic ring	BL	BL	BL	BL	BL	BL	2019-04-14
11	White plastic sheet	BL	BL	BL	BL	Х	Х	2019-04-14
12	Silver metal screw	BL	BL	BL	BL	/	/	2019-04-14
13	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
14	White plastic sheet	BL	BL	BL	BL	Х	X	2019-04-14
15	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
16	Silver metal sheet	BL	BL	BL	Х	/	/	2019-04-14
17	Silver metal screw	BL	BL	BL	BL	/	/	2019-04-14
18	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
19	White plastic ring	BL	BL	BL	BL	BL	BL	2019-04-14
20	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
21	Black plastic ring	BL	BL	BL	BL	BL	BL	2019-04-14
22	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
23	Green plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
24	Red metal sheet	Х	BL	BL	BL	/	/	2019-04-14
25	Silver metal sheet	BL	BL	BL	Х	/	/	2019-04-14
26	Brown plastic linen	BL	BL	BL	BL	BL	BL	2019-04-14



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0.5.55				i	Results			Date of
Seq. No.	Tested Part(s)	Cd	Pb	Ца	Cr(Cr ⁶⁺) [▼]	В	r [▼]	sample submission/r
		Cu	PD	Hg	Cr(Cr)	PBBs	PBDEs	esubmission
27	Blue plastic linen	BL	BL	BL	BL	BL	BL	2019-04-14
28	Yellow plastic linen	BL	BL	BL	BL	BL	BL	2019-04-14
29	Red metal wire	BL	BL	BL	BL	/	/	2019-04-14
30	Red plastic linen	BL	BL	BL	BL	BL	BL	2019-04-14
31	Black plastic linen	BL	BL	BL	BL	BL	BL	2019-04-14
32	Silver wire	BL	BL	BL	BL	/	/	2019-04-14
33	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
34	Silver metal sheet	BL	BL	BL	BL	/	/	2019-04-14
35	Transparent plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
36	Silver meta sheet	BL	BL	BL	BL	/	/	2019-04-14
37	Gray plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
38	Green tape	BL	BL	BL	BL	BL	BL	2019-04-14
39	Red metal wire	BL	BL	BL	BL	/	/	2019-04-14
40	Grey Ceramic Sheet	BL	BL	BL	BL	BL	BL	2019-04-14
41	White plastic sheet	BL	BL	BL	BL	Х	X	2019-04-14
42	Yellow tape	BL	BL	BL	BL	BL	BL	2019-04-14
43	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
44	Grey Ceramic Sheet	BL	BL	BL	BL	BL	BL	2019-04-14
45	Red metal wire	BL	BL	BL	BL	/	/	2019-04-14
46	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14
47	Silver metal sheet	BL	BL	BL	BL	/	/	2019-04-14
48	Black plastic ring	BL	BL	BL	BL	BL	BL	2019-04-14
49	Grey metal sheet	BL	BL	BL	BL	/	/	2019-04-14
50	Yellow tape	BL	BL	BL	BL	BL	BL	2019-04-14
51	Silver metal sheet	BL	BL	BL	BL	/	/	2019-04-14
52	Silver metal sheet	BL	BL	BL	BL	/	/	2019-04-14
53	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14



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Com				ı	Results			Date of	
Seq. No.	Tested Part(s)	Cd	Pb	Hg	Cr(Cr ⁶⁺) [▼]	В	r [▼]	sample submission/r	
		Cu	FD	ng	rig Ci(Ci)		PBDEs	esubmission	
54	Red plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14	
55	Black Ceramic Sheet	BL	BL	BL	BL	BL	BL	2019-04-14	
56	Green Ceramic Ring	BL	BL	BL	BL	BL	BL	2019-04-14	
57	Gold wire	BL	BL	BL	BL	/	/	2019-04-14	
58	Red metal wire	BL	BL	BL	BL	/	/	2019-04-14	
59	Blue capacitor	BL	BL	BL	BL	BL	BL	2019-04-14	
60	Green capacitor	BL	BL	BL	Х	Х	Х	2019-04-14	
61	Gray plastic sheet	BL	BL	BL	BL	Х	Х	2019-04-14	
62	Silver plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14	
63	Black IC	BL	BL	BL	BL	BL	BL	2019-04-14	
64	chip resistor	BL	BL	BL	Х	BL	BL	2019-04-14	
65	Black IC	BL	BL	BL	BL	BL	BL	2019-04-14	
66	Brown capacitor	BL	BL	BL	BL	BL	BL	2019-04-14	
67	Black IC	BL	BL	BL	BL	BL	BL	2019-04-14	
68	Black Diode	BL	BL	BL	BL	BL	BL	2019-04-14	
69	Tin solder	BL	BL	BL	BL	/	/	2019-04-14	
70	PCB board	BL	BL	BL	BL	Х	Х	2019-04-14	
71	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14	
72	Black plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14	
73	Silver metal sheet	BL	BL	BL	Х	/	/	2019-04-14	
74	White plastic sheet	BL	BL	BL	BL	BL	BL	2019-04-14	
75	Silver metal screw	BL	BL	BL	Х	/	/	2019-04-14- 2019-05-09	



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Note:

(1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material	
Cd	mg/kg	BL≤70-3σ <x <130+3σ≤OL</x 	BL≤70-3σ <x <130+3σ≤OL</x 	BL≤50-3σ <x <150+3σ≤OL</x 	
Pb	mg/kg	BL≤700-3σ <x <1300+3σ≤OL</x 	BL≤700-3σ <x <1300+3σ≤OL</x 	BL≤500-3σ <x <1500+3σ≤OL</x 	
Hg	mg/kg	BL≤700-3σ <x <1300+3σ≤OL</x 	BL≤700-3σ <x <1300+3σ≤OL</x 	BL≤500-3σ <x <1500+3σ≤OL</x 	
Cr	mg/kg	BL≤700-3σ <x< td=""><td>BL≤700-3σ<x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<></td></x<>	BL≤700-3σ <x< td=""><td>BL≤500-3σ<x< td=""></x<></td></x<>	BL≤500-3σ <x< td=""></x<>	
Br	mg/kg	BL≤300-3σ <x< td=""><td></td><td>BL≤250-3σ<x< td=""></x<></td></x<>		BL≤250-3σ <x< td=""></x<>	



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Note:

BL = Below Limit
OL = Over Limit
X = Inconclusive

- (2) The XRF screening test for RoHS elements The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2015/863/EC amending RoHS directive 2011/65/EU:
- (4) ▼=For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr(VI), and the results showed the total Cr content

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000
Dibuyl Phthalate(DBP)	1000
Benzylbutyl Phthalate(BBP)	1000
Bis(2-ethylhexyl) Phthalate(DEHP)	1000
Diispbutyl phthalate(DIBP)	1000

Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.



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B. EU RoHS Directive 2011/65/EU and its amendment Directives 2015/863/EU on Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP, DIBP content.

Test method:

Lead & Cadmium Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Mercury Content:

With reference to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Hexavalent Chromium Content:

With reference to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

BBP DBP DEHP & DIBP Content:

With reference to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

1) The test results of Cadmium (Cd)

Itom	Unit	MDL	Results	Limit	
Item	Offic	WIDE	(24)		
Cadmium Content (Cd)	mg/kg	2	N.D.	100 mg/kg	
Conclusion	1	1	Pass	/	

2) The test results of Hexavalent Chromium (Cr6+)(for nonmetal)

Item	Unit	MDL	Res	Limit	
item	Oilit	IVIDE	(60)	(64)	
Hexavalent Chromium (Cr ⁶⁺)	mg/kg	2	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	/

3) The test results of Hexavalent Chromium (Cr6+)(metal)

Item	Unit	MDL			Limit		
			(9)	(16)	(25)	(73)	
Hexavalent Chromium (Cr ⁶⁺)	ug/cm ²	0.10	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	Pass	/



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Note:

- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 μg/cm²
- mg/kg = ppm=parts per million
- N.D.=Not Detected(<MDL or LOQ)
- *The sample is negative for Cr(VI)-The Cr(VI) concentration is below 0.10ug/cm²
 The coating is considered a non-Cr(VI) based coating.
- #1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).
- #3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to the statement provided by the customer, according to RoHS directive 2011/65/EU and its amendments, Cadmium and its compounds in electrical contact is exempted.
- Flow chart appendix is included.

-	Photo appendix is include	ed.



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4) The test results of DBP、BBP、DEHP & DIBP

Item	Unit	MDL			Limit	
non-	Oilit	WIDE	4	10	15	Lillin
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	445.0	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/

ltem	Unit	MDL			Limit	
	Oilit	IVIDE	19	20	21	Lillit
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/

Item	Unit	MDL			Limit	
nom	Oilit	WIDE	26	27	28	Lillin
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	74.8	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/



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Item	Unit MDL		Results			Limit	
item	Oilit	IVIDL	30	31	35	Lillin	
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg	
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg	
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg	
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg	
Conclusion	1	1	Pass	Pass	Pass	/	

Item	Unit	MDL			Limit	
nem	Oilit	Offic MDL	38	42	46	Lillit
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	84.1	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/

Item	Unit	MDL		Results		Limit
item	Onit	OTHE WIDE	48	50	72	Lillit
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/



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Item	Unit MDL				Limit	
Item	Oilit	OTHE MIDE	1+2+13	18+22+23	33+37+43	Lillit
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/

Item	Unit	MDL		Results		Limit
Rem	Offic	IVIDL	53+54+62	71+74+6	7+11+14	Lillit
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/



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Item	Unit	Unit MDL Results			Limit	
Rem	Oilit	IVIDL	40+41+44	55+56+59	60+61+63	Lillin
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	/

Item	Unit	MDL	Res	ults	Limit
nem	Offic	IVIDE	64+65+66	67+68+70	Lillin
Dibuyl Phthalate(DBP)	mg/kg	50	N.D.	N.D.	1000 mg/kg
Benzylbutyl Phthalate(BBP)	mg/kg	50	N.D.	N.D.	1000 mg/kg
Bis(2-ethylhexyl) Phthalate(DEHP)	mg/kg	50	N.D.	N.D.	1000 mg/kg
Diispbutyl phthalate(DIBP)	mg/kg	50	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	/



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5) The test results of PBBs & PBDEs

lta-m	l lmit	MDI		Res		Limit	
Item	Unit	MDL	(7)	(11)	(14)	(41)	Limit
Polybrominated Biphenyls (PBBs)							
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Polybrominated Diphenylethers (PBDEs)(Mon-Deca)							
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	Pass	1



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Itam	l lnit	MDI		Limit		
Item	Unit	MDL	(60)	(61)	(70)	Limit
Polybrominated Biphenyls (PBBs)						
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	1000 mg/kg
Polybrominated Diphenylethers (PBDEs)(Mon-Deca)						
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	N.D.	1000 mg/kg
Conclusion	1	1	Pass	Pass	Pass	1

Remark:

- mg/kg = ppm
- N.D. = Not detected
- Flow chart appendix is included.
- Photo appendix is included.



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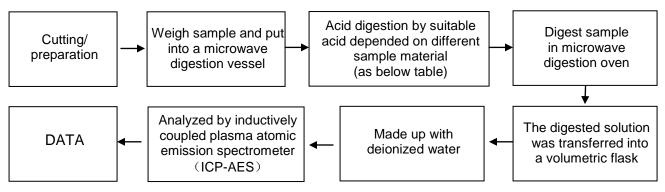
Tel: (86)755-23353209 Internet: Http://www.LCS-cert.com

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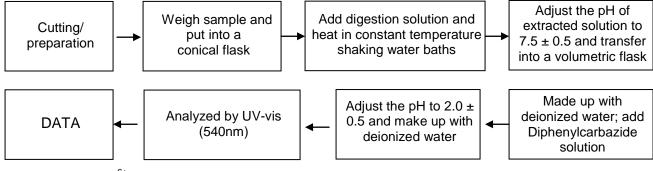
Appendix

Test Flow chart

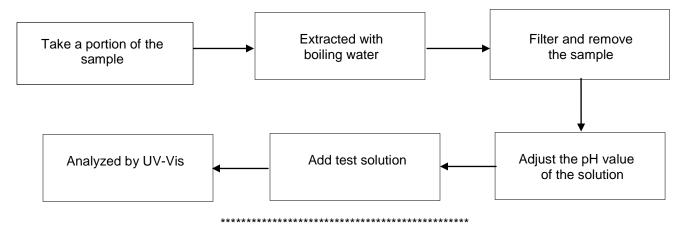
Test Flow chart for Cd / Pb /Hg content
 These samples were dissolved totally by pre-conditioning method according to below flow chart.



2. Test Flowchart for Cr⁶⁺ content (For non-metal material)



Test Flowchart for Cr⁶⁺ content (For metal material)



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3. Test Flow chart for PBBs & PBDEs & DBP & BBP & DEHP & DIBP content

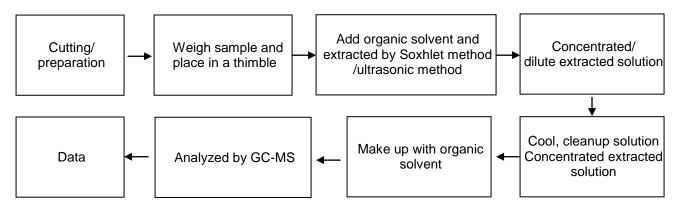


Table:

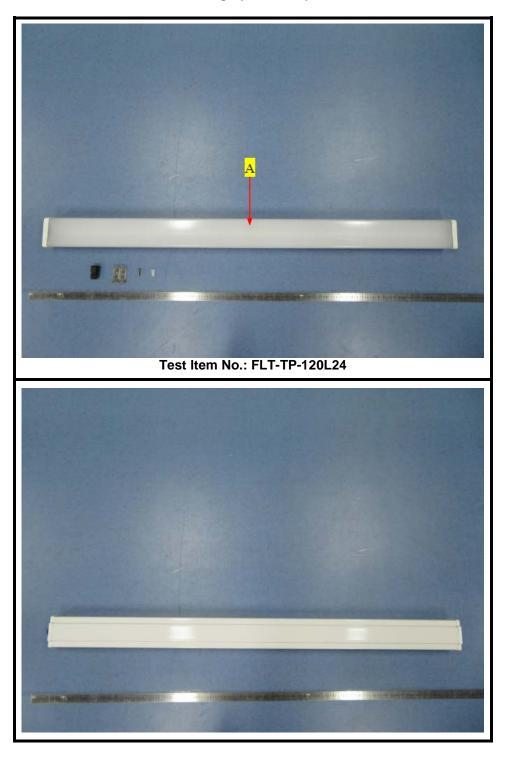
Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
Glass	HNO₃/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCI
Others	Any acid to total digestion



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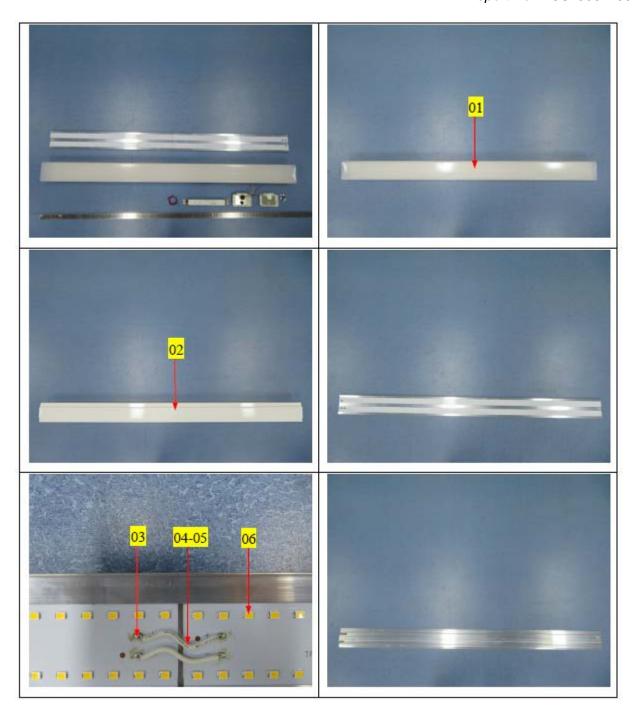
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Appendix Photograph of Sample



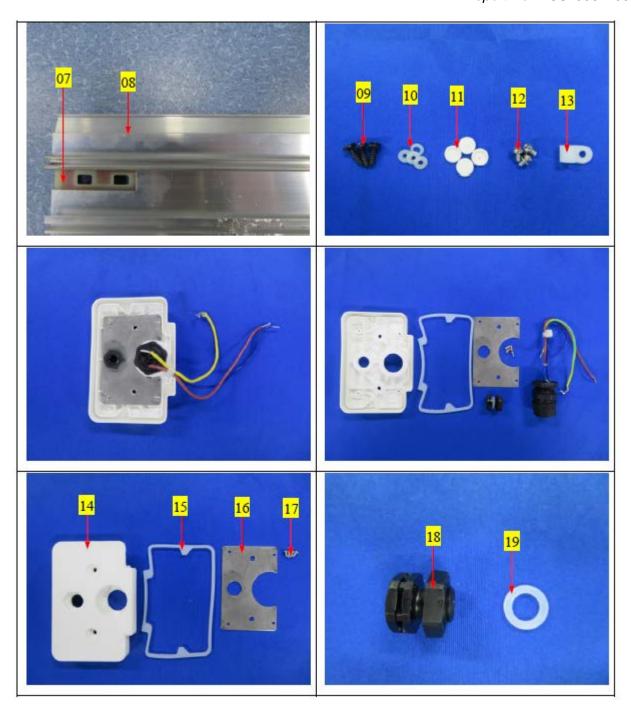


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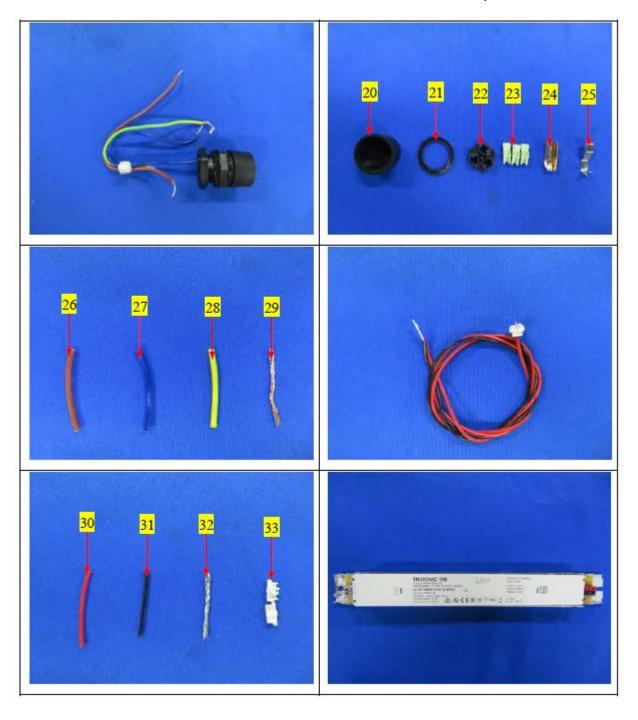


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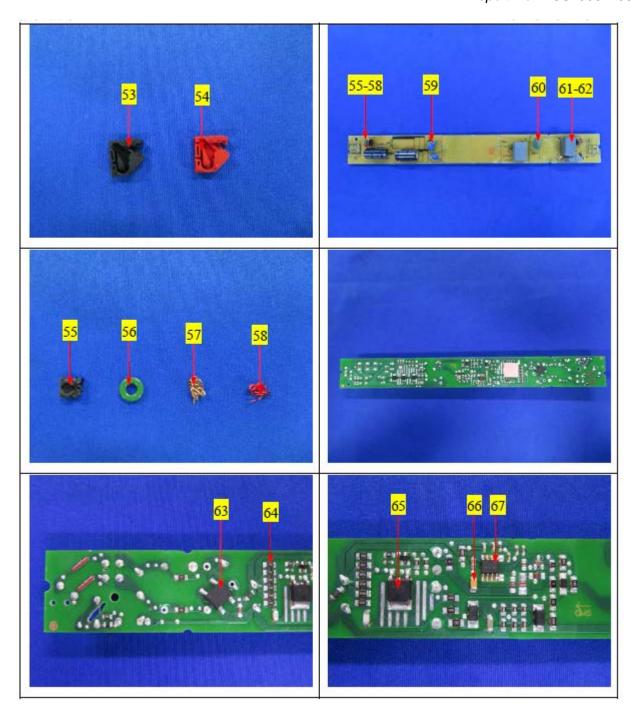


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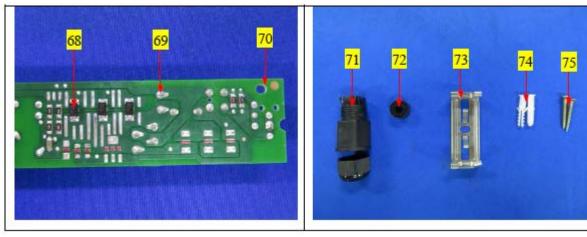


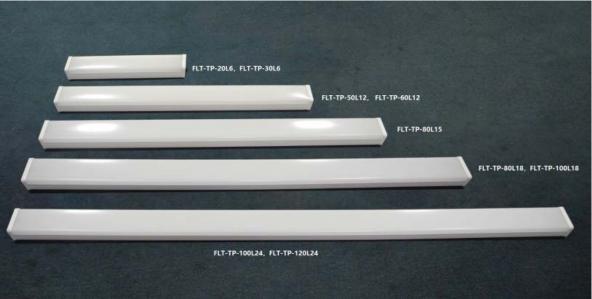
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Exempted Items of RoHS Directive

In accordance with Directive 2011/65/EU as amended , there are 41 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 ≥ 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 ≥ 50 W and < 150 W: 5 mg	
1(d)	For general lighting purposes ≥ 150 W: 15 mg	
1(e)	For general lighting purposes with circular or square structural shape and tube diameter ≤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 ≤ 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 (≥ 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.



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		No limitation of use until 31 December 2011; 15
2(b)(3)	Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9)	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 (≤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 (> 1500 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 Ra > 60:	
4(b)-I	P ≤ 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≤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 ≤ 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 ≤ 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.



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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.	
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)-l	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 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.
7(c)-IV	Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors.	



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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	
8(b)	Cadmium and its compounds in electrical contacts.	market before 1 January 2012.	
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.	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)-(l)	Lead in bearing shells and bushes for refrigerant -containing hermetic scroll compressors with a stated electrical power input equal or below 9 kW for heating, ventilation, air conditioning and refrigeration (HVACR) applications.	Applies to category 1; expires on 21 July 2019.	
11(a)	Lead used in C-press compliant pin connector systems.	May be used in spare parts for EEE placed on the market before 24 September 2010.	
11(b)	Lead used in other than C-press compliant pin connector systems.	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013.	
12	Lead as a coating material for the thermal conduction module C-ring.	May be used in spare parts for EEE placed on the market before 24 September 2010.	
13(a)	Lead in white glasses used for optical applications.	Applies to all categories; expires on: -21 July 2023 for category 8 in vitro diagnostic medical devices; -21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; -21 July 2021 for all other categories and subcategories.	
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards.	Applies to categories 8, 9 and 11; expires on: -21 July 2023 for category 8 in vitro diagnostic medical devices; -21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; -21 July 2021 for other subcategories of categories 8 and 9.	



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13(b)-(l)	Lead in ion coloured optical filter glass types.		
13(b)-(II)	Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex.	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10.	
13(b)-(III)	Cadmium and lead in glazes used for reflectance standards.		
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.	Expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011.	
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages.		
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).	Expires 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).		
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.	



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21	Lead and cadmium in printing inks for the application of enamels on glasses, such as	
23	borosilicate and soda lime glasses. Lead in finishes of fine pitch components other than connectors with a pitch of 0, 65 mm and	May be used in spare parts for EEE placed on the market before 24 September 2010.
	less. Lead in solders for the soldering to machined	market before 24 deptember 2010.
24	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.	
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.	
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.	



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39	Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm 2 of light-emitting area) for use in solid state illumination or display systems.	Expires on 1 July 2014.	
40	Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment.	Expires on 31 December 2013.	
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.	Expires on 31 December 2018.□	

****** End of Report ********

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Revision History

Revision	Issue Date	Revision Content	Revised By