Report No.	**48.400.20.8024.00-00/02**
Dated	**2020-12-08**

China

Technical Report

Client:	**Jiangsu Acrel Electrical Manufacturing. Co., Ltd.** No. 5, Dongmeng Road, Nanzha Street, Jiangyin, Jiangsu, P. R. China
Contact person:	Han zhonghua
Test object:	**The submitted samples were received and described by client as:** **Product: AGF-AE-D** **Model: AGF-AE-D/200**

Tested sample description:	Refer to next page(s).
Test specification:	**2011/65/EU (RoHS) Directive and 2015/863/EU (RoHS amendment) Directive** Test with reference to EN 62321-1:2013, EN 62321-2:2014, EN 62321-3-1:2014, EN 62321-4:2014/A1:2017, EN 62321-5:2014, EN 62321-6:2015, EN 62321-7-1:2015, EN 62321-7-2:2017 and EN 62321-8:2017.
Test result:	Refer to the data listed in following pages
Conclusion:	With regard to the data of tested components, the requirements of Directive 2011/65/EU (RoHS) and 2015/863/EU are **complied.**
Remarks:	1. The tested samples were identified and appointed by client. 2. The result relates only to the items tested.

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1. Order

1.1 Date of Purchase Order,
2020-12-04

1.2 Customer's Reference
Nil

1.3 Receipt Date of Test Sample
2020-11-09

1.4 Date of Testing
2020-11-24 – 2020-12-02

1.5 Location of Testing
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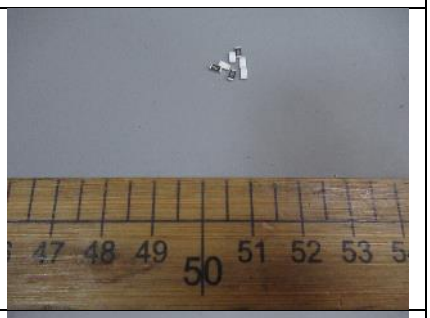
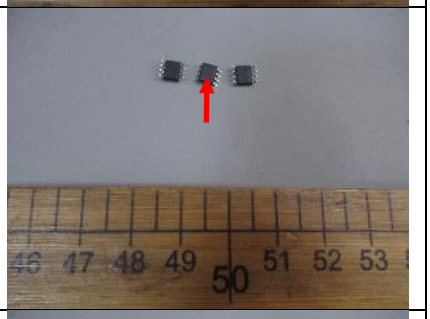
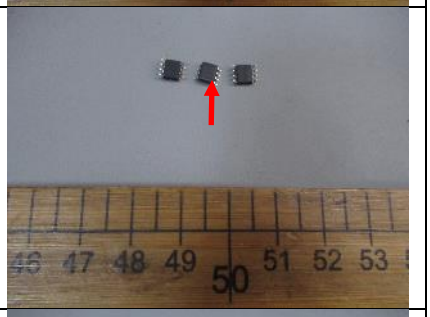
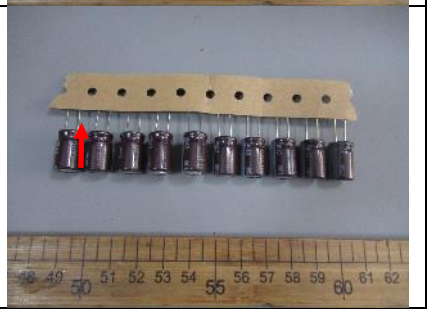
2. Description of the tested specimen

Sample No.	Result	Description (Material, colour)	Photograph/Location
01	**Pass**	Black hard resistance CR1206-390k(±1%, 100PPM)	
02	**Pass**	Black hard IC CR0603-510Ω(±5%, 100PPM)	
03	**Pass**	Silver metal pin	
04	**Pass**	Brown Electrolytic capacitor sheath C-10*16-400V-10uF-±20%(UCY2G100MPD)	
05	**Pass**	Silver metal pin	

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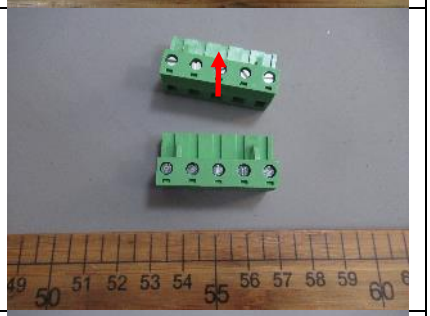
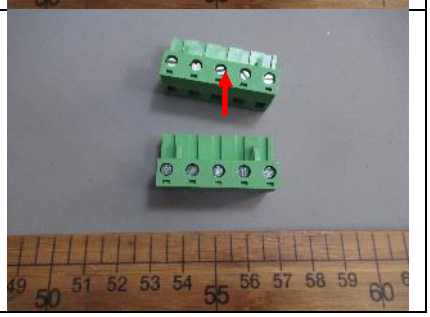
Sample No.	Result	Description (Material, colour)	Photograph/Location
06	**Pass**	Silvery metal shell	
07	**Pass**	Gray soft plastic film	
08	**Pass**	Black rubber cushion	
09	**Pass**	Green hard plastic terminal OQ-O/90D-5.08-8P(空5PIN)	
10	**Pass**	Silvery metal screw	

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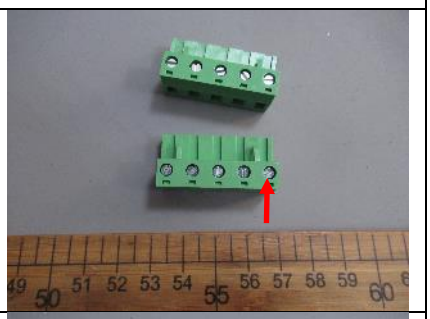
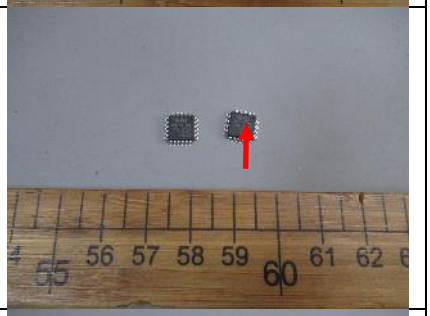
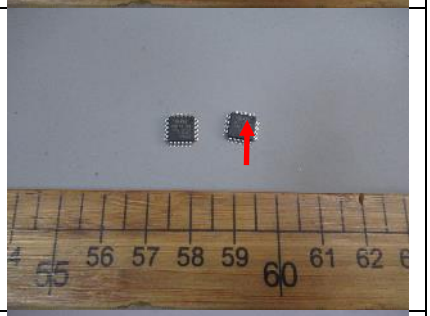
Sample No.	Result	Description (Material, colour)	Photograph/Location
11	**Pass**	Silvery copper alloy bracket	
12	**Pass**	Black diode 1N4007-SMD(M7)	
13	**Pass**	Black hard IC STM32F030C8T6用在AMC72(II)和AMC96(II)时和CKS32F030C8T6相互替换使用	
14	**Pass**	Silver metal pin	
15	**Pass**	White light-emitting diode 0805-黄绿-普亮-侧躺双色(12-22SURSYGC/S530-A3/E2/TR8)	

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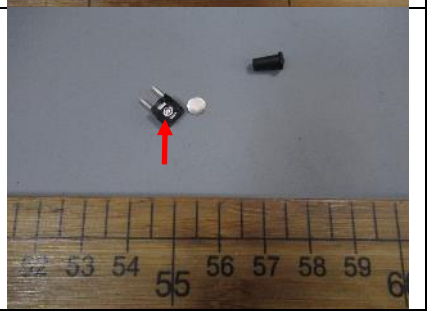
Sample No.	Result	Description (Material, colour)	Photograph/Location
16	**Pass**	Golden hard SMD crystal 3225-12MHz(SMD3225-4P 12.000MHz 20pF/±20ppm)	
17	**Pass**	Golden hard SMD crystal 5032 8.192MHz/20PF/±20PPM	
18	**Pass**	Black hard plastic button 6*6*10（侧按）	
19	**Pass**	Silvery metal bracket	
20	**Pass**	Black hard plastic base	

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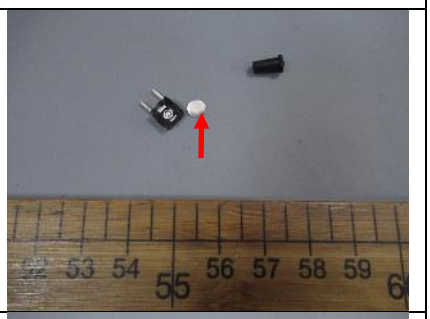
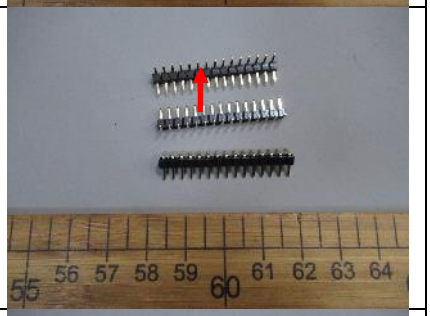
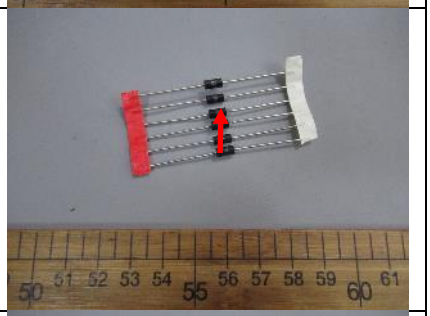
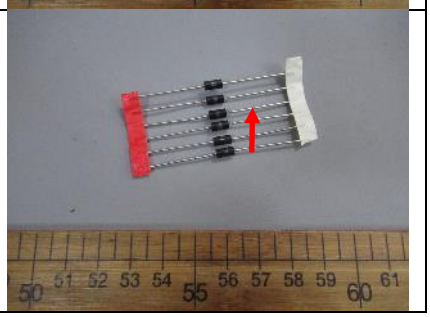
Sample No.	Result	Description (Material, colour)	Photograph/Location
21	**Pass**	Silvery metal slice	
22	**Pass**	Silvery metal Pin 21B12564-15D00B-01G-4/3	
23	**Pass**	Black hard plastic Insertion	
24	**Pass**	Black discrete type diode P6KE6.8CA	
25	**Pass**	Silver metal pin	

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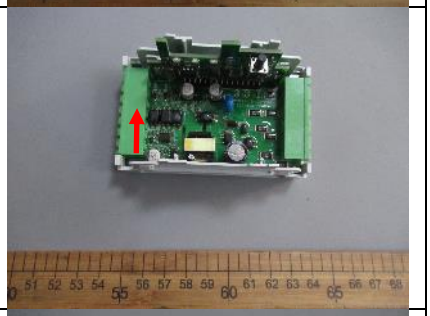
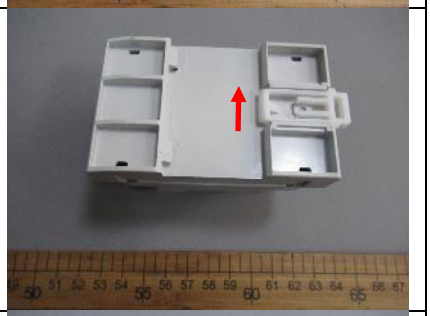
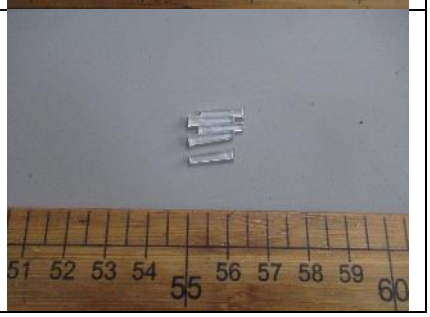
Sample No.	Result	Description (Material, colour)	Photograph/Location
26	**Pass**	Gray hard plastic cover GB-AKH0.66-K-24-S02-B-01	
27	**Pass**	White paper label	
28	**Pass**	Green hard plastic plug TJ-7.62-5P	
29	**Pass**	Gray hard plastic shell KT-AGF-AE-D-S02-A-B-01	
30	**Pass**	Transparent hard plastic light guide column DGZASJ10-GQ-S02T-J01	

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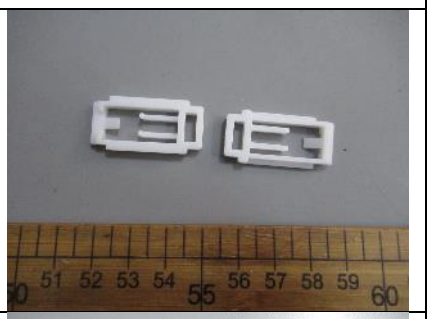
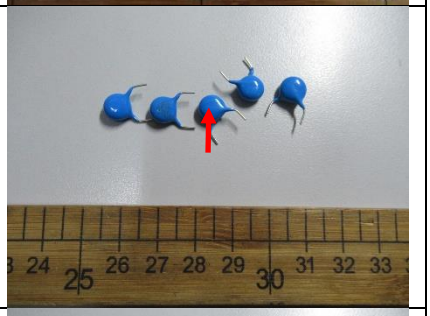
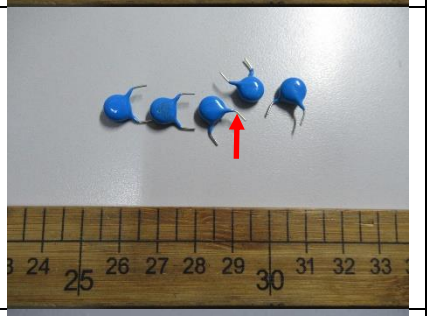
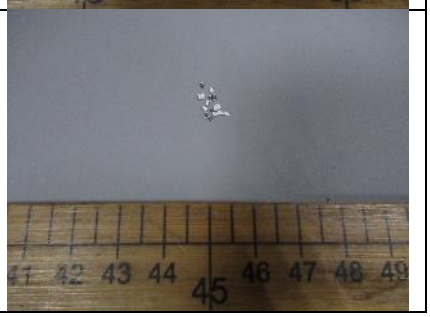
Sample No.	Result	Description (Material, colour)	Photograph/Location
31	**Pass**	White hard plastic locking piece DTSF1352-SJ01	
32	**Pass**	Blue hard high voltage capacitor 2.2nF/400V(±20%) L=4.0mm	
33	**Pass**	Silver metal pin	
34	**Pass**	Black resistance CR0603-10kΩ (±1%, 100PPM)	
35	**Pass**	Black resistance CR0603-10kΩ(±1%, 100PPM)	

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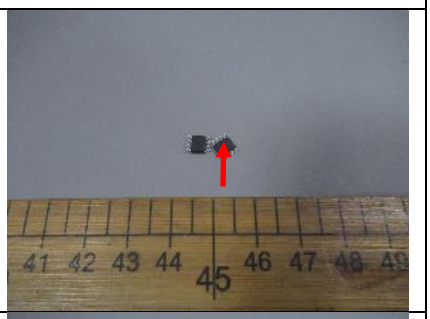
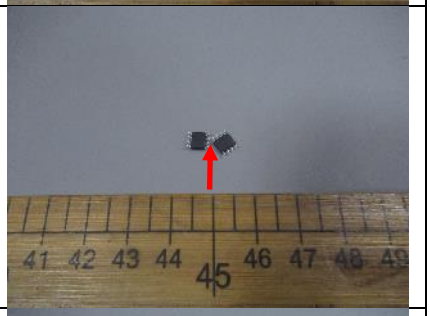
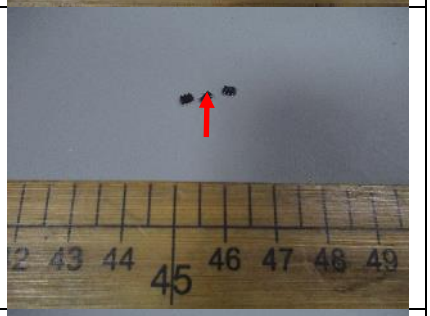
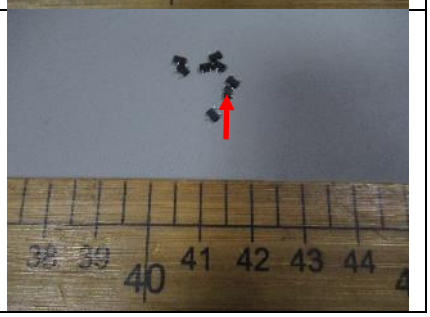
Sample No.	Result	Description (Material, colour)	Photograph/Location
36	**Pass**	Black hard IC MB85RC16 (可与 FM24CL16B-GTR互相替换使用)	
37	**Pass**	Silver metal pin	
38	**Pass**	Black hard IC TLV70033DDCR	
39	**Pass**	Silver metal pin	
40	**Pass**	Black hard IC AMS431AM(BM)-SMD	

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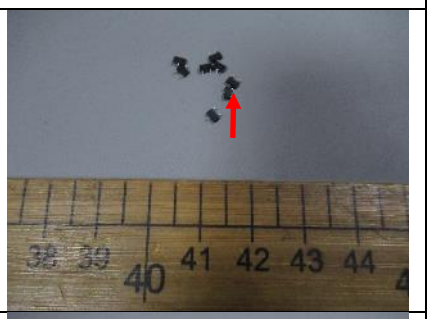
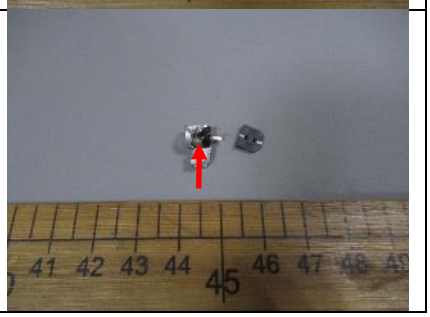
Sample No.	Result	Description (Material, colour)	Photograph/Location
41	**Pass**	Silver metal pin	
42	**Pass**	Silvery metal chip electrolytic capacitor shell CD220μF/16V(±20%, 105℃)(6.3*7.7)	
43	**Pass**	Silver metal pin	
44	**Pass**	Black hard plastic cover	
45	**Pass**	Gray paper film	

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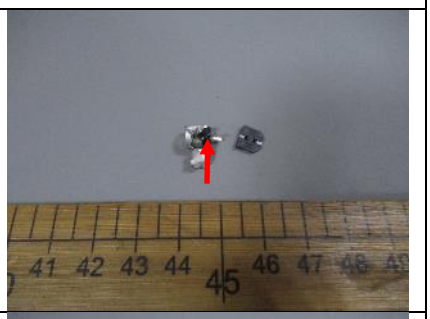
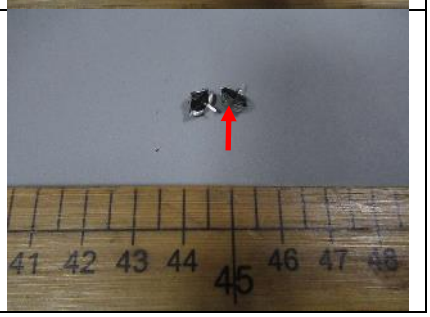
Sample No.	Result	Description (Material, colour)	Photograph/Location
46	**Pass**	Black rubber cushion	
47	**Pass**	Silvery metal chip electrolytic capacitor shell CD100μF/16V(±20%, 105℃)6.3*5.3 尺寸公差±0.1	
48	**Pass**	Silver metal pin	
49	**Pass**	Black hard plastic cover	
50	**Pass**	Gray paper film	

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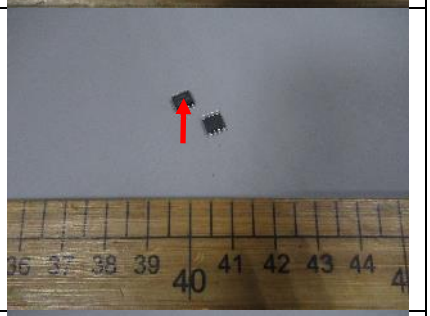
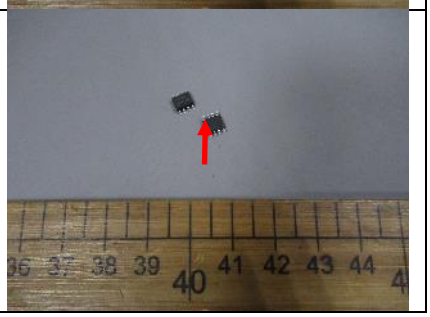
Sample No.	Result	Description (Material, colour)	Photograph/Location
51	**Pass**	Black rubber cushion	
52	**Pass**	Brown capacitor CC0603X7R1μF/25V(±10%)	
53	**Pass**	Golden diode LL4148-SMD	
54	**Pass**	black hard IC ISL3152EIBZ-T	
55	**Pass**	Silver metal pin	

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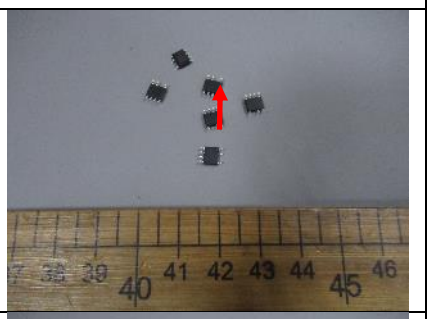
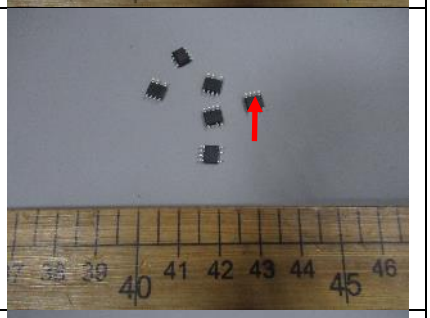
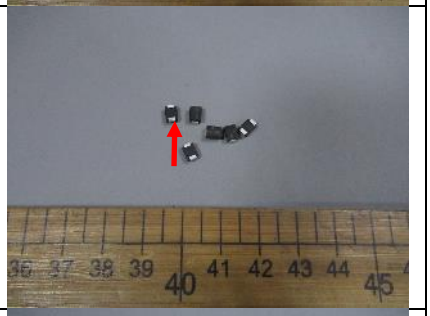
Sample No.	Result	Description (Material, colour)	Photograph/Location
56	**Pass**	black hard IC TNY286DG-TL SOP8	
57	**Pass**	Silver metal pin	
58	**Pass**	Black diode SMBJ150A	
59	**Pass**	Silver metal pin	
60	**Pass**	Gray capacitor CC0805X5R10μF/16V(±10%)	

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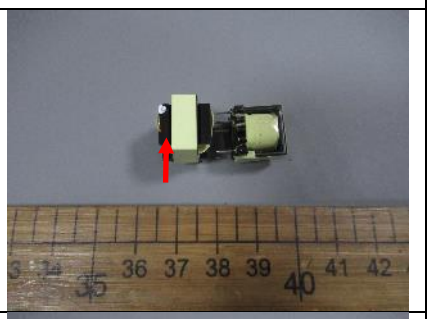
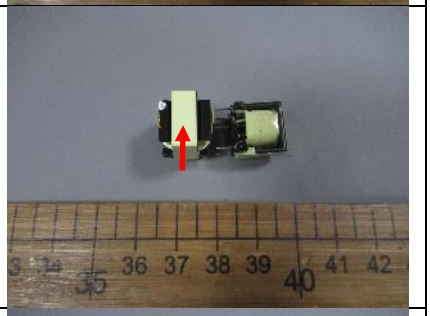
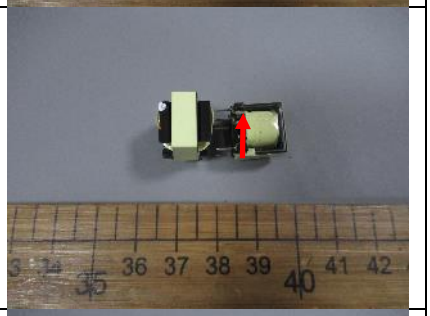
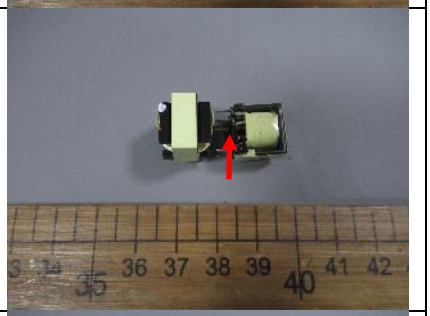
Sample No.	Result	Description (Material, colour)	Photograph/Location
61	**Pass**	Black hard switching transformer shell T-EE13-220V-5V-8V-3KV-2(EE13-58-2)	
62	**Pass**	Yellow soft plastic adhesive tape	
63	**Pass**	Black metal magnet	
64	**Pass**	Silver metal pin	
65	**Pass**	Yellow soft plastic wire jacket	

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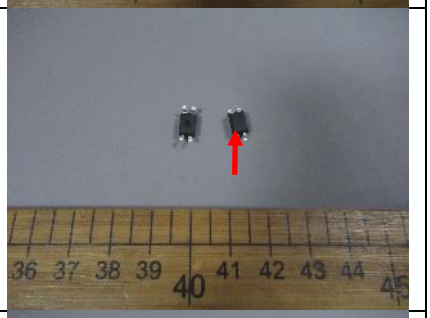
Sample No.	Result	Description (Material, colour)	Photograph/Location
66	**Pass**	Transparent soft plastic wire jacket	
67	**Pass**	golden metal wire	
68	**Pass**	Black diode SOT-23 BAV199LT1G	
69	**Pass**	Black hard patch optocoupler LTV-816S-TA1-D (与LTV-816S-TA1-D3互为替换物料)	
70	**Pass**	Silver metal pin	

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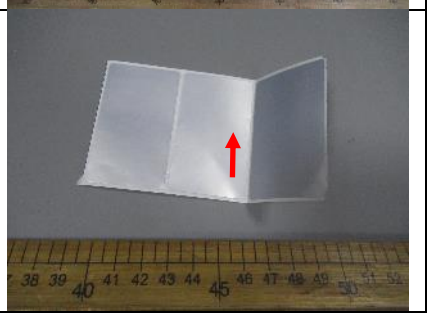
Sample No.	Result	Description (Material, colour)	Photograph/Location
71	**Pass**	Black diode SO-123塑封 1N4148	
72	**Pass**	Green printed board hard PCB	
73	**Pass**	Silver metal solder	
74	**Pass**	Brown paper shell B-210X150X70-ZH-01	
75	**Pass**	Silvery soft plastic label 35*20	

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Sample No.	Result	Description (Material, colour)	Photograph/Location
76	**Pass**	Transparent soft plastic inflatable bag QT-14A142(ARCM300-J8)	

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3. Test Results

3.1 ED-XRF Spectrometer test for total Cadmium, Chromium, Mercury, Lead and Bromine according to EN 62321-3-1:2014

Criteria of XRF test results

Pass:

Because of the nature of the testing procedure (caused by the uncertainty of the used, XRF method), a definite pass is given only if the XRF test score is less than 60% of the respective RoHS limit.

Inconclusive:

If the XRF test score is between 60% and 150% of the respective RoHS limit, further chemical test on the sample is required.

Fail:

A definite FAIL is given if the XRF test score is above 150% of the respective RoHS limit

***Explanation for RoHS limit**

Regarding Chromium and Bromine, the XRF test score shows the total Chromium and the total Bromine, but the RoHS limit of 1000 mg/kg, according to the directive 2011/65/EU, is only for Hexavalent Chromium and Brominated Flame Retardants. Therefore, if the XRF test result for the total Chromium and the total Bromine is more than 600 mg/kg and 300 mg/kg respectively, further analytical tests are necessary to find out the exact amount of Hexavalent Chromium and Brominated Flame Retardants

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
ROHS LIMIT	**100**	**1000**	**1000**	**1000**	**1000**	
Pass result	**< 60**	**< 600**	**< 600**	**< 600**	**< 300**	
Inconclusive result	**60 – 150**	**600 – 1500**	**600 – 1500**	**> 600**	**> 300**	
Fail result	**> 150**	**> 1500**	**> 1500**	**-**	**-**	
01	<30	2397***	<30	**2654**	<30	**Inconclusive**
02	<30	<30	<30	<30	<30	**Pass**
03	<30	<30	<30	<30	--	**Pass**
04	<30	<30	<30	<30	<30	**Pass**
05	<30	<30	<30	63	--	**Pass**
06	<30	<30	<30	<30	--	**Pass**
07	<30	<30	<30	<30	<30	**Pass**
08	<30	<30	<30	<30	<30	**Pass**
09	<30	<30	<30	<30	<30	**Pass**
10	<30	63	<30	582	--	**Pass**
11	<30	**7413****	<30	<30	--	**Inconclusive**
12	<30	131	<30	<30	<30	**Pass**
13	<30	<30	<30	<30	<30	**Pass**
14	<30	<30	<30	<30	--	**Pass**
15	<30	<30	<30	<30	<30	**Pass**
16	<30	<30	<30	129	<30	**Pass**
17	<30	<30	<30	**1077**	<30	**Inconclusive**

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
ROHS LIMIT	**100**	**1000**	**1000**	**1000**	**1000**	
Pass result	**< 60**	**< 600**	**< 600**	**< 600**	**< 300**	
Inconclusive result	**60 – 150**	**600 – 1500**	**600 – 1500**	**> 600**	**> 300**	
Fail result	**> 150**	**> 1500**	**> 1500**	**-**	**-**	
18	<30	<30	<30	<30	<30	**Pass**
19	<30	53	<30	77	--	**Pass**
20	<30	<30	<30	<30	<30	**Pass**
21	<30	<30	<30	<30	--	**Pass**
22	<30	<30	<30	<30	**--**	**Pass**
23	<30	<30	<30	<30	**35095**	**Inconclusive**
24	<30	366	<30	<30	<30	**Pass**
25	<30	61	<30	<30	--	**Pass**
26	<30	<30	<30	<30	<30	**Pass**
27	<30	<30	<30	<30	<30	**Pass**
28	<30	<30	<30	<30	**61210**	**Inconclusive**
29	<30	<30	<30	<30	<30	**Pass**
30	<30	<30	<30	<30	<30	**Pass**
31	<30	<30	<30	<30	<30	**Pass**
32	<30	<30	<30	<30	<30	**Pass**
33	<30	84	<30	52	--	**Pass**
34	<30	643***	<30	585	<30	**Pass**

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
ROHS LIMIT	**100**	**1000**	**1000**	**1000**	**1000**	
Pass result	**< 60**	**< 600**	**< 600**	**< 600**	**< 300**	
Inconclusive result	**60 – 150**	**600 – 1500**	**600 – 1500**	**> 600**	**> 300**	
Fail result	**> 150**	**> 1500**	**> 1500**	**-**	**-**	
35	<30	684***	<30	584	<30	**Pass**
36	<30	<30	<30	<30	**4383**	**Inconclusive**
37	<30	<30	<30	<30	--	**Pass**
38	<30	<30	<30	<30	<30	**Pass**
39	<30	<30	<30	<30	--	**Pass**
40	<30	<30	<30	<30	<30	**Pass**
41	<30	<30	<30	<30	--	**Pass**
42	<30	387	<30	<30	--	**Pass**
43	55	<30	<30	<30	--	**Pass**
44	<30	<30	<30	<30	<30	**Pass**
45	<30	<30	<30	<30	<30	**Pass**
46	<30	<30	<30	<30	<30	**Pass**
47	<30	177	<30	<30	--	**Pass**
48	58	<30	<30	<30	--	**Pass**
49	<30	<30	<30	<30	<30	**Pass**
50	<30	<30	<30	<30	<30	**Pass**
51	<30	<30	<30	<30	<30	**Pass**

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
ROHS LIMIT	**100**	**1000**	**1000**	**1000**	**1000**	
Pass result	**< 60**	**< 600**	**< 600**	**< 600**	**< 300**	
Inconclusive result	**60 – 150**	**600 – 1500**	**600 – 1500**	**> 600**	**> 300**	
Fail result	**> 150**	**> 1500**	**> 1500**	**-**	**-**	
52	<30	<30	<30	<30	<30	**Pass**
53	53	41285***	<30	<30	<30	**Pass**
54	<30	<30	<30	<30	<30	**Pass**
55	<30	<30	<30	<30	--	**Pass**
56	<30	<30	<30	<30	<30	**Pass**
57	<30	<30	<30	<30	--	**Pass**
58	<30	195	<30	<30	<30	**Pass**
59	43	132	<30	96	--	**Pass**
60	<30	<30	<30	<30	<30	**Pass**
61	<30	<30	<30	<30	112	**Pass**
62	<30	<30	<30	<30	<30	**Pass**
63	<30	<30	<30	80	--	**Pass**
64	<30	<30	<30	<30	--	**Pass**
65	<30	<30	<30	<30	<30	**Pass**
66	<30	<30	<30	<30	<30	**Pass**
67	<30	<30	<30	<30	--	**Pass**
68	<30	<30	<30	<30	<30	**Pass**

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
ROHS LIMIT	**100**	**1000**	**1000**	**1000**	**1000**	
Pass result	**< 60**	**< 600**	**< 600**	**< 600**	**< 300**	
Inconclusive result	**60 – 150**	**600 – 1500**	**600 – 1500**	**> 600**	**> 300**	
Fail result	**> 150**	**> 1500**	**> 1500**	**-**	**-**	
69	<30	<30	<30	<30	**13161**	**Inconclusive**
70	<30	<30	<30	<30	--	**Pass**
71	<30	<30	<30	<30	<30	**Pass**
72	<30	123	<30	<30	<30	**Pass**
73	<30	79	<30	<30	--	**Pass**
74	<30	<30	<30	<30	<30	**Pass**
75	<30	<30	<30	<30	<30	**Pass**
76	<30	<30	<30	<30	<30	**Pass**

Remark:

1. “<” means “less than”.
2. “mg/kg” denotes ”milligram per kilogram”.
3. With regard to the stoichiometry of Br in PBBs and PBDEs, the lower limit for Br is set at 300 mg/kg.
4. “ --” means the substance for this sample are not tested.
5. “ ** ” means the result is exempted according to 2011/65/EU ANNEX item 6: Lead as an alloying element in steel containing up to 0.35 % lead by weight, aluminum containing up to 0.4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
6. “ *** ” means the result is exempted according to 2011/65/EU ANNEX item 7(c)-I: Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors.

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7. **3.2 Wet chemical test**

Main instruments used for wet chemical test

Testing Target	Instrument	Method
Lead & Cadmium	ICP-OES	EN 62321-5:2014
Mercury	ICP-OES	EN 62321-4:2014/A1:2017
Hexavalent Chromium	UV-Vis	EN 62321-7-1:2015 EN 62321-7-2:2017
PBBs & PBDEs	GC/MS	EN62321-6:2015
DEHP, BBP, DBP & DIBP	GC/MS	EN 62321-8:2017

Criteria of chemical test results

Pass:

A definite Pass is given If the chemical test result meets the requirements of RoHS.

Fail:

A definite Fail is given If the chemical test result exceeds the full respective RoHS limit.

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Test Sample	Cadmium [mg/kg]	Lead [mg/kg]	Mercury [mg/kg]	Chromium (VI) [mg/kg]	PBBs (Sum) [mg/kg]	PBDEs (Sum) [mg/kg]	OVERALL RESULT
Limit	**100**	**1000**	**1000**	**1000**	**1000**	**1000**	
01	--	--	--	<2	--	--	**Pass**
11	--	26110**	--	--	--	--	**Pass**
17	--	--	--	<2	--	--	**Pass**
23	--	--	--	--	<50	<50	**Pass**
28	--	--	--	--	<50	<50	**Pass**
36	--	--	--	--	<50	<50	**Pass**
69	--	--	--	--	<50	<50	**Pass**

Remark:

1. ND = Not detected (Detected limit of Cd :2mg/kg;Pb, Hg, and Cr(VI):5mg/kg; PBBs and PBDEs: 5mg/kg)
2. " mg/kg " denotes " milligram per kilogram ".
3. "--" means the substance for this sample are not tested.
4. " ** " means the result is exempted according to 2011/65/EU ANNEX item 6: Lead as an alloying element in steel containing up to 0.35 % lead by weight, aluminum containing up to 0.4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.

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Test Sample	DEHP [mg/kg]	DBP [mg/kg]	BBP [mg/kg]	DIBP [mg/kg]	RESULT
Limit	**1000**	**1000**	**1000**	**1000**	
01+02+04+09+12	<200	<200	<200	<200	**Pass**
07+08+27	<200	<200	<200	<200	**Pass**
13+15+16+17+18	<200	<200	<200	<200	**Pass**
20+23+24+26+28	<200	<200	<200	<200	**Pass**
29+30+31+32+34	<200	<200	<200	<200	**Pass**
35+36+38+40+44	<200	<200	<200	<200	**Pass**
45+46+50	<200	<200	<200	<200	**Pass**
49+52+53+54+56	<200	<200	<200	<200	**Pass**
51+62+65	<200	<200	<200	<200	**Pass**
58+60+61+68+69	<200	<200	<200	<200	**Pass**
66+74+75	<200	<200	<200	<200	**Pass**
71+72+76	<200	<200	<200	<200	**Pass**

Remark:
1. "<" means "less than".
2. "mg/kg" denotes "milligram per kilogram".
3. DEHP = Di-(2-ethyl-hexyl)phthalate, DBP = Di-butyl phthalate
   BBP = Butyl-benzyl phthalate, DIBP = Di-iso-butyl phthalate

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Prepared by:

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Checked by:

Mr. Feng ZHANG

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APPENDIX I: Product Model

Product: AGF-AE-D	Test model: AGF-AE-D/200
	

Remark:

1. The report covers material testing on specified samples.

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APPENDIX II: Official Exemption Items

Below items are quoted based on Directives of 2011/65/EU and its valid Amending Directives.

Exemption		Scope and dates of applicability
1(a)	Single capped (compact) fluorescent lamps not exceeding (per burner): For general lighting purposes < 30W: 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)	Single capped (compact) fluorescent lamps not exceeding (per burner): 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)	Single capped (compact) fluorescent lamps not exceeding (per burner): For general lighting purposes ≥ 50 W and < 150 W: 5 mg	-
1(d)	Single capped (compact) fluorescent lamps not exceeding (per burner): For general lighting purposes ≥ 150 W: 15 mg	-
1(e)	Single capped (compact) fluorescent lamps not exceeding (per burner): 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)	Single capped (compact) fluorescent lamps not exceeding (per burner): For special purposes: 5 mg	-
1(g)	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner): 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)(1)	Double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp): 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)	Double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp): Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 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)	Double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp): 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)	Double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp): 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)	Double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp): 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)(1)	Other fluorescent lamps not exceeding (per lamp): Linear halophosphate lamps with tube > 28 mm (e.g. T10 and T12): 10 mg	Expires on 13 April 2012
2(b)(2)	Other fluorescent lamps not exceeding (per lamp): Non-linear halophosphate lamps (all diameters): 15 mg	Expires on 13 April 2016

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	Exemption	Scope and dates of applicability
2(b)(3)	Other fluorescent lamps not exceeding (per lamp): 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)	Other fluorescent lamps not exceeding (per lamp): 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(a)	Cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp): 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)	Cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp): Medium length (> 500 mm and ≤ 1 500 mm)	No limitation of use until 31 December 2011; 5 mg may be used per lamp after 31 December 2011
3(c)	Cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp): 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)	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)-I	High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: P ≤ 155 W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011
4(b)-II	High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: 155 W < P ≤ 405 W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(b)-III	High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: P > 405 W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(c)-I	Other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): 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	Other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): 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	Other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner): P > 405 W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(d)	High Pressure Mercury (vapour) lamps (HPMV)	Expires on 13 April 2015
4(e)	Metal halide lamps (MH)	-
4(f)	Other discharge lamps for special purposes not specifically mentioned in this Annex	-
4(g)	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;	Expires on 31 December 2018

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	Exemption	Scope and dates of applicability
	(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.	
5(a)	Glass of cathode ray tubes	-
5(b)	Glass of fluorescent tubes not exceeding 0.2 % by weight	-
6(a)	Alloying element in steel for machining purposes and in galvanised steel containing up to 0.35 % lead by weight	Expires on: —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
6(a)-I	Lead as an alloying element in steel for machining purposes containing up to 0,35 % lead by weight and in batch hot dip galvanised steel components containing up to 0,2 % lead by weight	Expires on 21 July 2021 for categories 1-7 and 10.'
6(b)	Alloying element in aluminium containing up to 0.4 % lead by weight	Expires on: —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
6(b)-I	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight, provided it stems from lead-bearing aluminium scrap recycling	Expires on 21 July 2021 for categories 1-7 and 10
6(b)-II	Lead as an alloying element in aluminium for machining purposes with a lead content up to 0,4 % by weight	Expires on 21 July 2021 for categories 1-7 and 10
6(c)	Copper alloy containing up to 4 % lead by weight	Expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and ontrol instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
7(a)	High melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)	Applies to categories 1-7 and 10 (except applications covered by point 24 of this Annex) and expires on 21 July 2021. For categories 8 and 9 other than in vitro diagnostic medical devices and industrial

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		monitoring and control instruments expires on 21 July 2021. For category 8 in vitro diagnostic medical devices expires on 21 July 2023. For category 9 industrial monitoring and control instruments, and for category 11 expires on 21 July 2024.
7(b)	Solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications	-
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound	Applies to categories 1-7 and 10 (except applications covered under point 34) and expires on 21 July 2021. For categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments expires on 21 July 2021. For category 8 in vitro diagnostic medical devices expires on 21 July 2023. For category 9 industrial monitoring and control instruments, and for category 11 expires on 21 July 2024.
7(c)-II	Dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	Does not apply to applications covered by point 7(c)-I and 7(c)-IV of this Annex. Expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
7(c)-III	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	PZT based dielectric ceramic materials for capacitors which are part of integrated circuits or discrete semiconductors	Expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
8(a)	Cadmium and its compounds in one shot pellet type thermal cut-offs	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012

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	Exemption	Scope and dates of applicability
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: —circuit breakers, —thermal sensing controls, —thermal motor protectors (excluding hermetic thermal motor protectors), —AC switches rated at: —6 A and more at 250 V AC and more, or —12 A and more at 125 V AC and more, —DC switches rated at 20 A and more at 18 V DC and more, and —switches for use at voltage supply frequency ≥ 200 Hz.	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
9	Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution	Applies to categories 8, 9 and 11 and expires on: —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
9(a)-I	Up to 0,75 % hexavalent chromium by weight, used as an anticorrosion agent in the cooling solution of carbon steel cooling systems of absorption refrigerators (including minibars) designed to operate fully or partly with electrical heater, having an average utilised power input < 75 W at constant running conditions	Applies to categories 1-7 and 10 and expires on 5 March 2021.
9(a)-II	Up to 0,75 % hexavalent chromium by weight, used as an anticorrosion agent in the cooling solution of carbon steel cooling systems of absorption refrigerators: —designed to operate fully or partly with electrical heater, having an average utilised power input ≥ 75 W at constant running conditions, —designed to fully operate with non-electrical heater.	Applies to categories 1-7 and 10 and expires on 21 July 2021.
9(b)	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,

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Exemption		Scope and dates of applicability
		21 July 2021 for other subcategories of categories 8 and 9.
9(b)-I	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)	C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b)	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	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)	White glasses used for optical application	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)	Filter glasses and glasses used for reflectance standards	Applies to categories 8, 9 and 11; expires on: 21 July 2023 for category 8 in vitro diagnostic medical devices; 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; 21 July 2021 for other subcategories of categories 8 and 9
13(b)-I	Ion coloured optical filter glass types	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10
13(b)-II	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	Glazes used for reflectance standards	Applies to categories 1 to 7 and 10; expires on 21 July 2021 for categories 1 to 7 and 10
14	Solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight	Expired on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	Applies to categories 8, 9 and 11 and expires on: —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial

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	Exemption	Scope and dates of applicability
		monitoring and control instruments, and for category 11.
15(a)	Lead in solders to complete a viable electrical connection between the semiconductor die and carrier within integrated circuit flip chip packages where at least one of the following criteria applies: —a semiconductor technology node of 90 nm or larger; —a single die of 300 mm2 or larger in any semiconductor technology node; —stacked die packages with die of 300 mm2 or larger, or silicon interposers of 300 mm2 or larger.	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
16	Linear incandescent lamps with silicate coated tubes	Expires on 1 September 2013
17	Lead halide as Radiant agent in high intensity discharge (HID) lamps used for professional reprography applications	-
18(a)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb)	Expired on 1 January 2011
18(b)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb)	expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
18(b)-I	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps containing phosphors such as BSP (BaSi2O5:Pb) when used in medical phototherapy equipment	Applies to categories 5 and 8, excluding applications covered by entry 34 of Annex IV, and expires on 21 July 2021.
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	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

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Exemption		Scope and dates of applicability
		monitoring and control instruments, and for category 11.
21(a)	Cadmium when used in colour printed glass to provide filtering functions, used as a component in lighting applications installed in displays and control panels of EEE	Applies to categories 1 to 7 and 10 except applications covered by entry 21(b) or entry 39 and expires on 21 July 2021.
21(b)	Cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	Applies to categories 1 to 7 and 10 except applications covered by entry 21(a) or 39 and expires on 21 July 2021.
21(c)	Lead in printing inks for the application of enamels on other than borosilicate glasses	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.'
23	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	Solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Expires on: —21 July 2021 for categories 1-7 and 10, —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
25	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring	-
26	Lead oxide in 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	Expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and ontrol instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
30	Cadmium alloys as electrical/mechanical solder joints to 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	Soldering materials in mercury free flat fluorescent lamps (which, e.g. are used for liquid crystal displays, design or industrial lighting)	-
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	Expires on: —21 July 2021 for categories 1-7 and 10,

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	Exemption	Scope and dates of applicability
		—21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, —21 July 2023 for category 8 in vitro diagnostic medical devices, —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
33	Solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers	-
34	Cermet-based trimmer potentiometer elements	Expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
36	Cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010
37	Plating layer of high voltage diodes on the basis of a zinc borate glass body	Expires on: —21 July 2021 for categories 1-7 and 10; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; —21 July 2023 for category 8 in vitro diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	-
39(a)	Cadmium selenide in downshifting cadmium-based semiconductor nanocrystal quantum dots for use in display lighting applications (< 0.2 µg Cd per mm2 of display screen area)	Expires for all categories on 31 October 2019
40	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 (*1))	Applies to all categories and expires on: —31 March 2022 for categories 1 to 7, 10 and 11; —21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; --21 July 2023 for category 8 in vitro

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	Exemption	Scope and dates of applicability
		diagnostic medical devices; —21 July 2024 for category 9 industrial monitoring and control instruments.
42	Lead in bearings and bushes of diesel or gaseous fuel powered internal combustion engines applied in non-road professional use equipment: —with engine total displacement ≥ 15 litres; or —with engine total displacement < 15 litres and the engine is designed to operate in applications where the time between signal to start and full load is required to be less than 10 seconds; or regular maintenance is typically performed in a harsh and dirty outdoor environment, such as mining, construction, and agriculture applications.	Applies to category 11, excluding applications covered by entry 6(c) of this Annex. Expires on 21 July 2024.'
43	Bis(2-ethylhexyl) phthalate in rubber components in engine systems, designed for use in equipment that is not intended solely for consumer use and provided that no plasticised material comes into contact with human mucous membranes or into prolonged contact with human skin and the concentration value of bis(2-ethylhexyl) phthalate does not exceed: (a) 30 % by weight of the rubber for (i) gasket coatings; (ii) solid-rubber gaskets; or (iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine. (b) 10 % by weight of the rubber for rubber-containing components not referred to in point (a). For the purposes of this entry, “prolonged contact with human skin” means continuous contact of more than 10 minutes duration or intermittent contact over a period of 30 minutes, per day.	Applies to category 11 and expires on 21 July 2024.
44	Lead in solder of sensors, actuators, and engine control units of combustion engines within the scope of Regulation (EU) 2016/1628 of the European Parliament and of the Council (*1), installed in equipment used at fixed positions while in operation which is designed for professionals, but also used by non-professional users	Applies to category 11 and expires on 21 July 2024.

--END OF REPORT--

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