

Technical Report No.:48.400.12.7203.00
Revision 00

2012-06-12

Product Final Report

Client: Jiangsu Acrel Electric MFG Co., Ltd.
NO.5, Dongmeng Road, Nanzha Town, Jiangyin

Contact Person: Mr. Shen Fei

Sample Description: Product: Current transformers

Test sample: Model: AKH-0.66 30I



Received on May. 31, 2012

Additional model: AKH-0.66 40I, AKH-0.66 50II, AKH-0.66 60I,
AKH-0.66 60II, AKH-0.66 80II, AKH-0.66 40II,
AKH-0.66 100II

Purpose of examination: 2002/95/EC and 2011/65/EU (RoHS) Annex II Limitation and its valid amending Directives

Test method: IEC 62321, Edition 1.0 2008-12
Electro Technical Products – Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)

Test result: Refer to page 4~6 for detailed test results

Conclusion: With regard to the data of tested components, the requirements of Directive 2002/95/EC and 2011/65/EU (RoHS) are **complied**.

Remarks:





1. The result relates only to the items tested
2. Samples were tested as received
3. The additional models via same and covered material declarations as specified by client

No extract, abridgment or abstraction from the report can be published or used to advertise a product without the written consent from Jiangsu TÜV Product Service Ltd. On condition that the documentation(s) submitted by the client is valid and truthful, the data listed herein apply only to the particular sample tested under the specific as stated in corresponding test reports and not to other samples in regular production.

1. Description of the test subjects

Item	Result	Description(Material, colour)	Photo
Sample 001	Pass	Shell, light yellow, plastic	
Sample 002	Pass	Cover, transparent, plastic	
Sample 003	Pass	Seal ring, black, plastic	
Sample 004	Pass	Steel, deep grey	
Sample 005	Pass	Enamelled wire, golden, copper	
Sample 006	Pass	Ink belt, black	

Continued:

Item	Result	Description(Material, colour)	Photo
Sample 007	Pass	Labe, white, plastic	
Sample 008	Pass	Washer, silvery, metal	
Sample 009	Pass	Screw, silvery, metal	
Sample 010	Pass	Nut, silvery, metal	

2 Test result:

2.1 ED-XRF Spectrometer test for total Cadmium, Chromium, Mercury, Lead and Bromine according to IEC 62321, Edition 1.0 2008-12

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.

Retest:

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.

Compounds	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Chromium [mg/kg]	Total Mercury [mg/kg]	Total Bromine [mg/kg]	OVERALL RESULT
RoHS Limit	100	1000	1000	1000	1000	
"Pass"	< 60	< 600	< 600	< 600	< 300	
"Retest"	60 ~150	600 ~ 1500	>600	600~1500	> 300	
"Fail "	> 150	> 1500	--	> 1500	--	
Sample 001	<20	<20	<20	<20	63146	Retest
Sample 002	<20	<20	<20	<20	<20	Pass
Sample 003	<20	<20	<20	<20	134	Pass
Sample 004	21	115	5241	<20	--	Retest
Sample 005	<20	39	<20	<20	--	Pass
Sample 006	22	<20	<20	<20	<20	Pass
Sample 007	<20	<20	<20	<20	<20	Pass
Sample 008	<20	141	301	<20	--	Pass
Sample 009	<20	200	166	<20	--	Pass
Sample 010	<20	79	750	<20	--	Retest

Remarks :

- (a) "<" means "less than".
- (b) "mg/kg" denotes "milligram per kilogram".
- (c) "--" means "Not Applicable".

***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 1000mg/kg, according to the directive 2005/618/EC, 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 600mg/kg and 300mg/kg respectively, further analytical tests are necessary to find out the exact amount of Hexavalent Chromium and Brominated Flame Retardants.



China

2.2 Wet chemical test

Main instruments used for wet chemical test

Testing Target	Instrument	Method
Lead & Cadmium	ICP-OES	IEC 62321, Edition 1.0 2008-12
Mercury	ICP-OES	
Hexavalent Chromium	UV-Vis	
PBBs & PBDEs	GC/MS	

2.2.1 Wet chemical test for four heavy metals and Brominated Flame Retardants

Test Sample	Lead [mg/kg]	Cadmium [mg/kg]	Mercury [mg/kg]	Chromium (VI) [mg/kg]	PBBs (Sum) [mg/kg]	PBDEs (Sum) [mg/kg]	Overall Result
Limit	1000	100	1000	1000	1000	1000	
Sample 001	--	--	--	--	<50	<50	Pass
Sample 004	--	--	--	ND	--	--	Pass
Sample 010	--	--	--	ND	--	--	Pass



China

PBBs	021
MONOBROMOBIPHENYL	ND
DIBROMOBIPHENYL	ND
TRIBROMOBIPHENYL	ND
TETRABROMOBIPHENYL	ND
PENTABROMOBIPHENYL	ND
HEXABROMOBIPHENYL	ND
HEPTABROMOBIPHENYL	ND
OCTABROMOBIPHENYL	ND
NONABROMOBIPHENYL	ND
DECABROMOBIPHENYL	ND
Total Sum of PBBs	<50
PBDEs	
MONOBROMODIPHENYL ETHER	ND
DIBROMODIPHENYL ETHER	ND
TRIBROMODIPHENYL ETHER	ND
TETRABROMODIPHENYL ETHER	ND
PENTABROMODIPHENYL ETHER	ND
HEXABROMODIPHENYL ETHER	ND
HEPTABROMODIPHENYL ETHER	ND
OCTABROMODIPHENYL ETHER	ND
NONABROMODIPHENYL ETHER	ND
DECABROMODIPHENYL ETHER	ND
Total Sum of PBDEs	<50

Remarks:

1. ND = Not detected (Detected limit of Pb, Hg, Cd and Cr (VI):2mg/kg; PBBs and PBDEs: 5mg/kg)
2. "mg/kg" denotes "milligram per kilogram"
3. "--" means the item is not tested.

TÜV SÜD Product Service GmbH

Project Engineer:

Mr. Feng ZHANG



Reviewer:

Mr. Yongfeng DU

APPENDIX I



AKH-0.66 40II



AKH-0.66 40II



AKH-0.66 50II



AKH-0.66 60I



AKH-0.66 60II



AKH-0.66 80II



AKH-0.66 100II

APPENDIX II

Official Exemption Items

Below items are quoted based on 2002/95/EC and its valid Amending Directives.

Exemption		Scope and dates of applicability
1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner)	
1(a)	For general lighting purpose < 30 W:5mg	Expires on 31 December 2011; 3,5mg maybe 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 ≥ 30 W and < 50 W:5mg	Expires on 31 December 2011; 3.5mg
1(c)	For general lighting purposes ≥ 50 W and < 150 W:5mg	
1(d)	For general lighting purpose ≥ 30 W and ≥ 150 W:15mg	
1(e)	For general lighting purpose with circular or square structural shape and tube diameter <17mm	No limitation of use until 31 December 2011; 7 mg may be used per burner after 31 December 2011
1(f)	For special purposes:5mg	
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): 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 ≥ 9 mm and ≤ 17 mm (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 >17 mm and ≤ 28 mm (e.g. T8): 5mg	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 >28mm (e.g. T12): 5mg	Expires on 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
2(a)(5)	Tri-band phosphor with long lifetime(≥ 25 000h):8mg	Expires on 13 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)(1)	Linear halophosphate lamps with tube >28 mm(e.g.T10 and T12): 10mg	Expires on 13 April 2012
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; 15 mg may be used per lamp after 31 December 2011
2(b)(4)	Lamps for other general lighting and special purposes (e.g. induction lamps)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011

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

Exemption		Scope and dates of applicability
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 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'	
8(a)	Cadmium and its compounds in one shot pellet type thermal cut-offs	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012
8(b)	Cadmium and its compounds in electrical contacts	
9	Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution	
9(b)	Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	
11(a)	Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b)	Lead used in other than C-press compliant pin connector systems	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013
12	Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
13(a)	Lead in white glasses used for optical applications	
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards	
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight	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	

Exemption		Scope and dates of applicability
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) ₂ MgSi ₂ O ₇ :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(BaSi ₂ O ₅ :Pb)	
19	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL)	Expires on 1 June 2011
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)	Expires on 1 June 2011
21	Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	
25	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring	
26	Lead oxide in the glass envelope of black light blue lamps	Expires on 1 June 2011
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers	Expired on 24 September 2010
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (1)	
30	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more	
31	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)	
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	
33	Lead in solders for the soldering of thin copper wires of 100 um diameter and less in power transformers	
34	Lead in cermet-based trimmer potentiometer elements	



China

Exemption		Scope and dates of applicability
36	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39	Cadmium in colour converting II-VI LEDs (< 10 ug 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