

Test Report No.: 48.400.23.1087.01-00/03

Rev.: 00

Dated: 2023-10-30



Applicant: Jiangsu Acrel Electrical Manufacturing. Co., Ltd.
Address: No. 5, Dongmeng Road, Nanzha Street, Jiangyin, Jiangsu, P. R. China
Attn: Han Zhonghua
Sample Description: Current transformer
Model No.: AKH-0.66 K-Φ10(N)
Sample Received Date: 2023-10-12
Test Period: 2023-10-12~2023-10-27
Test Location: TÜV SÜD Certification and Testing (China) Co., Ltd.
Shanghai Branch, SHA Chemical Lab.
Purpose of examination: Verification of RoHS (Restriction of Hazardous Substances) directive 2011/65/EU and its amendment (EU) 2015/863 on submitted samples
Test Results: Refer to following page(s)
Remark:
- The result relates only to the items tested.
- The reference model(s) was declared by client.
- The test sample(s) and item(s) was specified by client.

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TÜV SÜD Certification and Testing (China) Co., Ltd.
TÜV SÜD Group
Prepared by:



Mr. Yiwei CHEN

Reviewed by:



Mr. Feng ZHANG

Disclaimer Measurement Uncertainty: Unless otherwise agreed upon, Pass or Fail verdicts are given base on the measured values without any considerations of measurement uncertainties. Please note, every test method has a measurement uncertainty which has been evaluated by the laboratory according to ISO/IEC 17025 requirements. By taking measurement uncertainties into account it might happen that measured values can neither be assessed as Pass nor as Fail. Any use for advertising purposes must be granted in writing. This test report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

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SUMMARY OF TEST RESULTS

No.	Test Requested	Conclusion	Remarks
1.	Heavy Metal (Pb, Cd, Hg and Cr VI) Content	PASS	
2.	Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs) Content	PASS	
3.	Phthalates (DEHP, BBP, DBP and DIBP) Content	PASS	

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1. TESTED SUBJECT DESCRIPTION

Sample No.	Description (Material, colour)	Photograph/Location
01	Silvery soft plastic label	
02	Red soft plastic wire jacket	
03	Yellow soft plastic wire jacket	
04	Silvery metal wire	
05	Black hard plastic shell	

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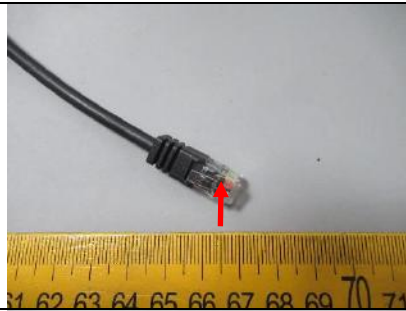

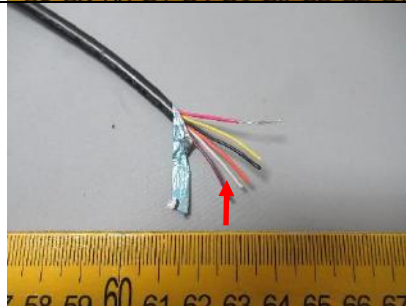


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Sample No.	Description (Material, colour)	Photograph/Location
06	Black metal magnet	
07	Silvery metal spring	
08	Gold copper alloy enameled wire	
09	Silvery metal piece	
10	Black soft plastic cable jacket	



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Sample No.	Description (Material, colour)	Photograph/Location
11	Transparent hard plastic plug	
12	Golden metal pin	
13	Blue soft plastic film	
14	Brown soft plastic wire jacket	
15	White soft plastic wire jacket	

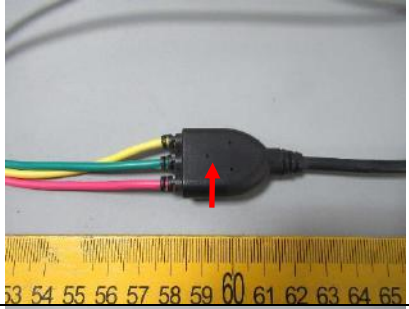


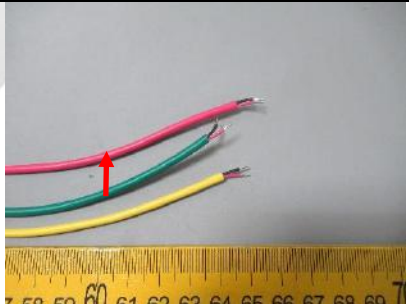
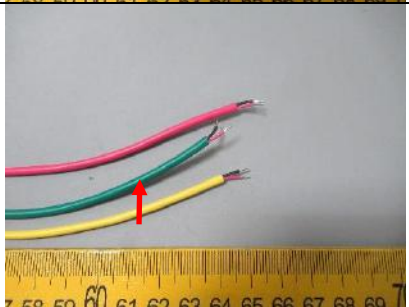


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Sample No.	Description (Material, colour)	Photograph/Location
16	Orange soft plastic wire jacket	
17	Black soft plastic wire jacket	
18	Yellow soft plastic wire jacket	
19	Red soft plastic wire jacket	
20	Silvery metal wire	

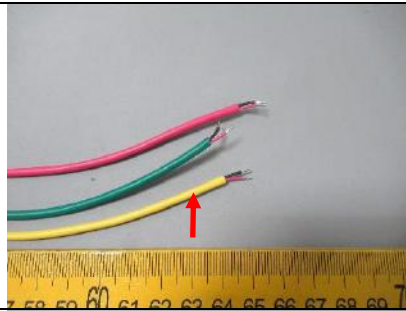
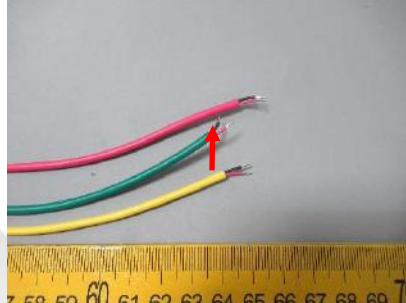
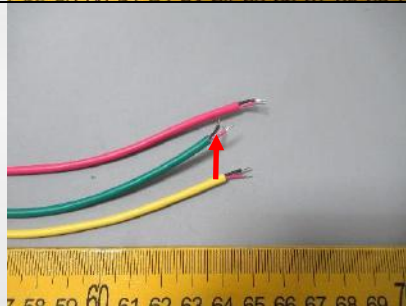
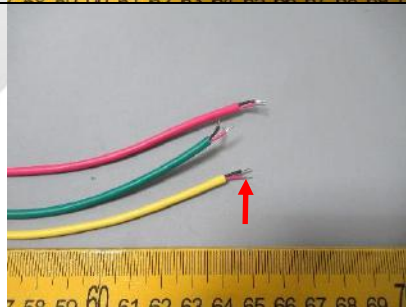
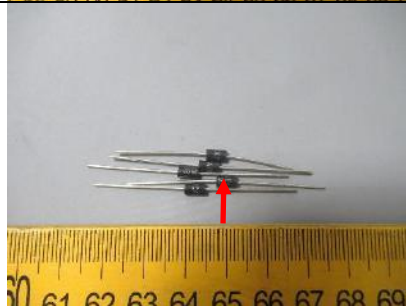


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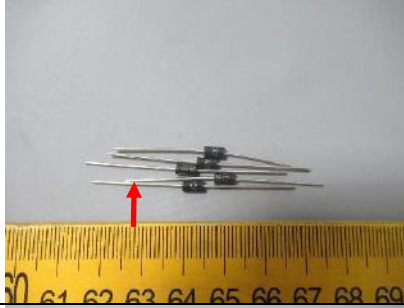

Sample No.	Description (Material, colour)	Photograph/Location
21	Black hard plastic sheath	
22	Transparent hard plastic sheath	
23	Silver metal solder	
24	Red soft plastic wire jacket	
25	Green soft plastic wire jacket	



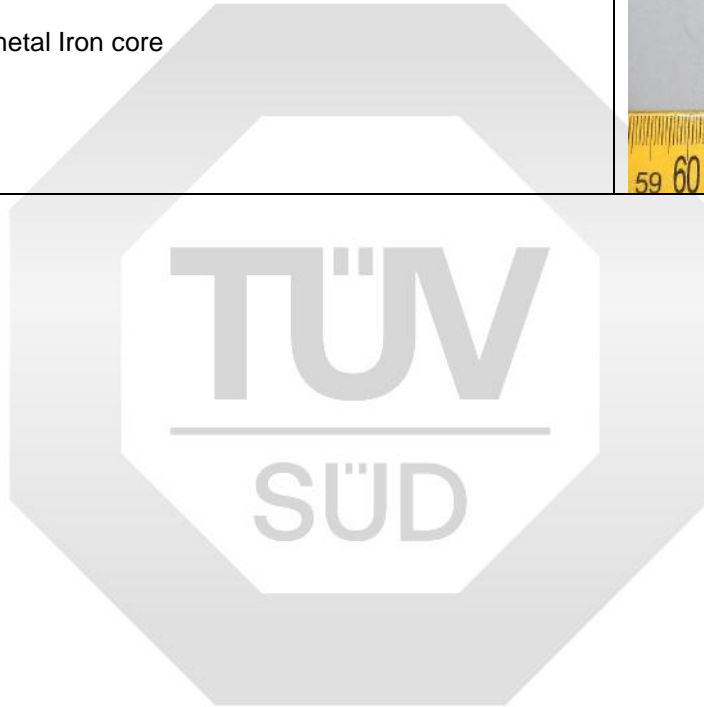
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Sample No.	Description (Material, colour)	Photograph/Location
26	Yellow soft plastic wire jacket	
27	Black soft plastic wire jacket	
28	Red soft plastic wire jacket	
29	Silvery metal wire	
30	Black diode	



Sample No.	Description (Material, colour)	Photograph/Location
31	Silvery metal pin	
32	Black metal Iron core	

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2. TEST RESULT(S)

2.1 SCREENING TEST

Test method: With reference to EN 62321-1:2013, EN IEC 62321-2:2021, EN 62321-3-1:2014 and EN 62321-8:2017.

For Heavy Metals and Flame Retardants, analyzed by Energy Dispersive X-ray Fluorescence Spectrometer (XRF); for phthalates, analyzed by Gas Chromatography and Mass Spectrometer (GC-MS).

Sample No.	Heavy Metals and Flame Retardants					Phthalates			
	Cd	Pb	Hg	Cr	Br	DEHP	BBP	DBP	DIBP
01	BL	BL	BL	BL	BL	BL	BL	BL	BL
02	BL	BL	BL	BL	BL	BL	BL	BL	BL
03	BL	BL	BL	BL	BL	BL	BL	BL	BL
04	BL	BL	BL	BL	NA	NA	NA	NA	NA
05	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
06	BL	BL	BL	BL	NA	NA	NA	NA	NA
07	BL	BL	BL	BL	NA	NA	NA	NA	NA
08	BL	BL	BL	BL	NA	NA	NA	NA	NA
09	BL	BL	BL	Inc. ^(a)	NA	NA	NA	NA	NA
10	BL	BL	BL	BL	BL	BL	BL	BL	BL
11	BL	BL	BL	BL	BL	BL	BL	BL	BL
12	BL	BL	BL	BL	NA	NA	NA	NA	NA
13	BL	BL	BL	BL	BL	BL	BL	BL	BL
14	BL	BL	BL	BL	BL	BL	BL	BL	BL
15	BL	BL	BL	BL	BL	BL	BL	BL	BL
16	BL	BL	BL	BL	BL	BL	BL	BL	BL
17	BL	BL	BL	BL	BL	BL	BL	BL	BL
18	BL	BL	BL	BL	BL	BL	BL	BL	BL
19	BL	BL	BL	BL	BL	BL	BL	BL	BL
20	BL	BL	BL	BL	NA	NA	NA	NA	NA

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Sample No.	Heavy Metals and Flame Retardants					Phthalates			
	Cd	Pb	Hg	Cr	Br	DEHP	BBP	DBP	DIBP
21	BL	BL	BL	BL	BL	BL	BL	BL	BL
22	BL	BL	BL	BL	BL	BL	BL	BL	BL
23	BL	BL	BL	BL	NA	NA	NA	NA	NA
24	BL	BL	BL	BL	BL	BL	BL	BL	BL
25	BL	BL	BL	BL	BL	BL	BL	BL	BL
26	BL	BL	BL	BL	BL	BL	BL	BL	BL
27	BL	BL	BL	BL	BL	BL	BL	BL	BL
28	BL	BL	BL	BL	BL	BL	BL	BL	BL
29	BL	BL	BL	BL	NA	NA	NA	NA	NA
30	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
31	BL	BL	BL	BL	NA	NA	NA	NA	NA
32	BL	BL	BL	Inc. ^(a)	NA	NA	NA	NA	NA

Remark:

- "BL" denotes below limit
- "OL" denotes over limit
- "Inc." denotes inconclusive
- "NA" denotes not applicable
- "(a)" denotes further confirmation test was conducted, results are listed in 2.2 and 2.3.



- XRF screening limits in mg/kg for regulated elements in various matrices

ELEMENT	POLYMER		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (70-3\sigma)$	$(70-3\sigma) < X < (130+3\sigma)$	$X \geq (130+3\sigma)$
Pb	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Hg	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Br	$X \leq (300-3\sigma)$	$X > (300-3\sigma)$	NA
Cr	$X \leq (700-3\sigma)$	$X > (700-3\sigma)$	NA

ELEMENT	METAL		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (70-3\sigma)$	$(70-3\sigma) < X < (130+3\sigma)$	$X \geq (130+3\sigma)$
Pb	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Hg	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Cr	$X \leq (700-3\sigma)$	$X > (700-3\sigma)$	NA

ELEMENT	COMPLEX MATERIAL		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (50-3\sigma)$	$(50-3\sigma) < X < (150+3\sigma)$	$X \geq (150+3\sigma)$
Pb	$X \leq (500-3\sigma)$	$(500-3\sigma) < X < (1500+3\sigma)$	$X \geq (1500+3\sigma)$
Hg	$X \leq (500-3\sigma)$	$(500-3\sigma) < X < (1500+3\sigma)$	$X \geq (1500+3\sigma)$
Br	$X \leq (250-3\sigma)$	$X > (250-3\sigma)$	NA
Cr	$X \leq (500-3\sigma)$	$X > (500-3\sigma)$	NA

- Screening limits in mg/kg for regulated phthalates in various matrices

PHthalATES	BL	INCONCLUSIVE
DEHP	$X < 600$	$X \geq 600$
BBP	$X < 600$	$X \geq 600$
DBP	$X < 600$	$X \geq 600$
DIBP	$X < 600$	$X \geq 600$

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2.2 HEAVY METAL CONTENT

Test method: With reference to EN 62321-4:2014 /A1:2017, EN 62321-5:2014, EN 62321-7-1:2015 and EN 62321-7-2:2017, analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) and Ultraviolet-visible spectrophotometer (UV-Vis).

[Reporting Limit: 2.0 mg/kg for Cadmium; 5.0 mg/kg or 0.10 µg/cm² for Hexavalent Chromium, 10.0 mg/kg for Lead and Mercury.]

Sample No.	Result(s)				
	Total Cadmium	Hexavalent Chromium	Hexavalent Chromium	Total Mercury	Total Lead
09	--	/	Negative	--	--
32	--	/	Negative	--	--
Unit	mg/kg	mg/kg	µg/cm²	mg/kg	mg/kg
RoHS Requirement	100	1000	Negative [#]	1000	1000

Remark:

- „mg/kg“ denotes milligram per kilogram
- „µg/cm²“ denotes micrograms per square centimeter
- „<“ denotes less than
- „Positive“ denotes the absorbance value of sample is > 0.13 µg/cm², the sample is considered to be positive for Hexavalent Chromium.
- „Inconclusive“ denotes the absorbance value of sample is ≥ 0.10 µg/cm² and ≤ 0.13 µg/cm², the sample is considered to be Inconclusive for Hexavalent Chromium.
- „Negative“ denotes the absorbance value of sample is < 0.10 µg/cm², the sample is considered to be negative for Hexavalent Chromium.
- „[#]“ According to DIRECTIVE 2011/65/EU Article 4(1) and Annex II. While, positive means the presence of CrVI on tested areas and the result(s) was (were) regarded as in conflict with European Parliament and Council Directive 2011/65/EU, Article 4(1) and Annex II.
- "--" denotes tested by XRF, result is listed in 2.1

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2.3 POLYBROMINATED BIPHENYLS (PBBs) AND POLYBROMINATED DIPHENYL ETHERS (PBDEs) CONTENT

Test Method: With reference to EN 62321-6:2015, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometer (GC-MS). [Reporting Limit : 5 mg/kg]


Test Item		Result(s) [mg/kg]		RoHS Requirement [mg/kg]
		05	30	
PBBs	Monobromobiphenyl	<5	<5	-
	Dibromobiphenyl	<5	<5	-
	Tribromobiphenyl	<5	<5	-
	Tetrabromobiphenyl	<5	<5	-
	Pentabromobiphenyl	<5	<5	-
	Hexabromobiphenyl	<5	<5	-
	Heptabromobiphenyl	<5	<5	-
	Octabromobiphenyl	<5	<5	-
	Nonabromobiphenyl	<5	<5	-
	Decabromobiphenyl	<5	<5	-
	Sum of detected PBBs		<50	<50
PBDEs	Monobromodiphenyl ether	<5	<5	-
	Dibromodiphenyl ether	<5	<5	-
	Tribromodiphenyl ether	<5	<5	-
	Tetrabromodiphenyl ether	<5	<5	-
	Pentabromodiphenyl ether	<5	<5	-
	Hexabromodiphenyl ether	<5	<5	-
	Heptabromodiphenyl ether	<5	<5	-
	Octabromodiphenyl ether	<5	<5	-
	Nonabromodiphenyl ether	<5	<5	-
	Decabromodiphenyl ether	<5	<5	-
	Sum of detected PBDEs		<50	<50

Remark:

- "mg/kg" denotes milligram per kilogram
- "<" denotes less than

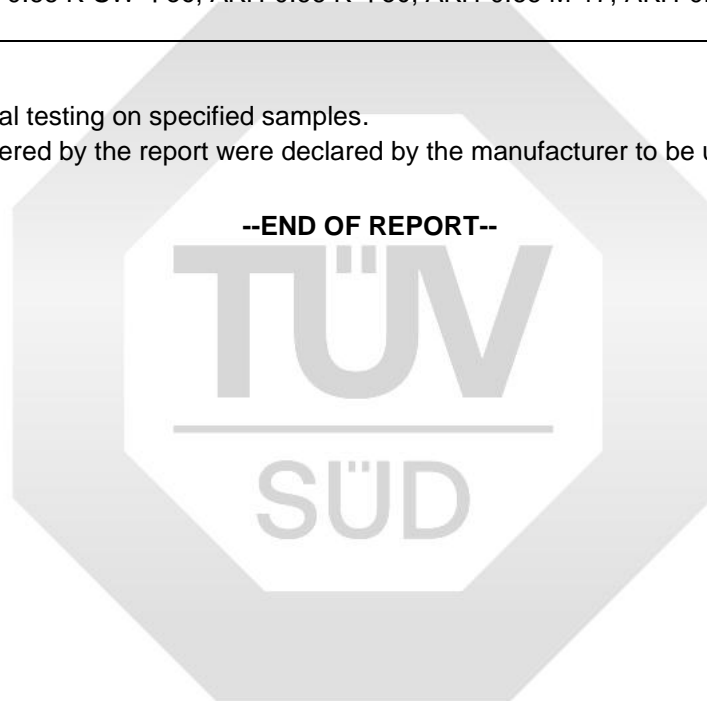


APPENDIX I: Product Model

Product: Current transformer	Test model: AKH-0.66 K-Φ10(N)
	
Additional models: AKH-0.66 K-Φ16(N), AKH-0.66 K-SW-Φ16, AKH-0.66 K-Φ24(N), AKH-0.66 K-SW-Φ24, AKH-0.66 K-Φ36(N), AKH-0.66 K-SW-Φ36, AKH-0.66 K-Φ50, AKH-0.66 M-17, AKH-0.66 M-22, AKH-0.66 M-32, AKH-0.66 M-42	

Remark:

1. The report covers material testing on specified samples.
2. The tested materials covered by the report were declared by the manufacturer to be used on the additional model.



--END OF REPORT--
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