

Report No.: 180285242a 001

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Client: NINGBO KINGDUN ELECTRONIC INDUSTRY CO., LTD.

Contact Information: No.28 Fengyuan Road, South of Economic Development Area, Yuyao City, Zhejiang, China

**Identification/
Model No(s):** Carbon Monoxide Alarm
KD-218E

Condition at delivery: Test item complete and undamaged.

Sample Receiving date: 2024-01-16

Testing Period: 2024-01-16 to 2024-01-23

Place of testing: Chemical laboratory Ningbo

Test Specification:

Test result:

Customer's requirement:

1. According to RoHS (recast): Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, 2011/65/EU Annex II and its amendment.

PASS

Other information:

Reference Model No(s): KD-218A, KD-218B, KD-218F, KD-218G, KD-218H

For and on behalf of
TÜV Rheinland/CCIC (Ningbo) Co., Ltd.

Chris Wang

2024-01-29

Chris W. W. Wang / Assistant Manager

Date

Name/Position

Sample information is provided by customer. Test result is drawn according to the kind and extent of tests performed.

This test report relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

"Decision Rule" document announced in our website (<https://www.tuv.com/landingpage/en/qm-gcn/>) describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report.

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Material List:

Item: Carbon Monoxide Alarm
 KD-218E

Material No.	Material	Color	Location
A001	Plastic	white	refer to photo
A002	Plastic	red	refer to photo
A003	Plastic	black	refer to photo
A004	Plastic	red	refer to photo
A005	Metal	silver	refer to photo
A006	Metal	silver	refer to photo
A007	Metal	silver	refer to photo
A008	Metal	silver	refer to photo
A009	Metal	silver	refer to photo
A010	Plastic	red	refer to photo
A011	Plastic	yellow	refer to photo
A012	Plastic	black	refer to photo
A013	Plastic	white	refer to photo
A014	Metal	silver	refer to photo
A015	Ceramic	white	refer to photo
A016	Plastic	white	refer to photo
A017	Plastic	white	refer to photo
A018	Plastic	transparent	refer to photo
A019	Glass	transparent	refer to photo
A020	Plastic	grey transparent	refer to photo
A021	Plastic	white	refer to photo
A022	Plastic	transparent	refer to photo
A023	Metal	silver	refer to photo
A024	Metal	silver	refer to photo
A025	Plastic	beige	refer to photo
A026	PCB board	green	refer to photo
A027	Plastic	blue	refer to photo
A028	Metal	silver	refer to photo

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A029	Plastic	transparent	refer to photo
A030	Solder	silver	refer to photo
A031	Glue	white	refer to photo
A032	Solder	silver	refer to photo
A033	Solder	silver	refer to photo
A034	Electronic components	black	refer to photo
A035	Solder	silver	refer to photo
A036	Metal	silver	refer to photo

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1.Screening Test by XRF spectroscopy

Test Method: Cadmium, Lead, Mercury, Chromium, Bromine
 -- With reference to IEC 62321-3-1:2013

Test Result:

Material No.	Cd	Cr	Pb	Hg	Br
A001	BL	BL	BL	BL	BL
A002	BL	BL	BL	BL	BL
A003	BL	BL	BL	BL	BL
A004	BL	BL	BL	BL	BL
A005	BL	d.(*1)	BL	BL	n.a.
A006	BL	d.(*1)	BL	BL	n.a.
A007	BL	BL	BL	BL	n.a.
A008	BL	d.(*1)	BL	BL	n.a.
A009	BL	d.(*1)	BL	BL	n.a.
A010	BL	BL	BL	BL	BL
A011	BL	BL	BL	BL	BL
A012	BL	BL	BL	BL	BL
A013	BL	BL	BL	BL	BL
A014	BL	BL	BL	BL	n.a.
A015	d.(*1)	BL	d.(*1)	BL	n.a.
A016	BL	BL	BL	BL	BL
A017	BL	BL	BL	BL	BL
A018	BL	BL	BL	BL	BL
A019	BL	BL	BL	BL	n.a.
A020	BL	BL	BL	BL	BL
A021	BL	BL	BL	BL	BL
A022	BL	BL	BL	BL	BL
A023	BL	d.(*1)	BL	BL	n.a.
A024	BL	d.(*1)	BL	BL	n.a.
A025	BL	BL	BL	BL	BL
A026	BL	BL	BL	BL	BL
A027	BL	BL	BL	BL	BL
A028	BL	d.(*1)	BL	BL	n.a.
A029	BL	BL	BL	BL	BL
A030	BL	BL	BL	BL	n.a.
A031	BL	BL	BL	BL	BL
A032	BL	BL	BL	BL	n.a.
A033	BL	BL	BL	BL	n.a.
A034	BL	BL	BL	BL	BL
A035	BL	BL	BL	BL	n.a.
A036	BL	BL	BL	BL	n.a.

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Abbreviation:	Pb	=	Lead
	Cd	=	Cadmium
	Hg	=	Mercury
	Cr	=	Chromium
	Br	=	Bromine
	n.a.	=	Not applicable
	BL	=	Below limit
	OL	=	Over limit
	d.	=	Detected

Remark:

- (*1) The screening result was detected in the inconclusive region or over limits, thus the further wet chemistry tests are suggested.
- (*2) Component(s)/ materials(s) with an area of less than 2 mm x 2 mm will not be selected for testing according to RoHS Directive 2011/65/EU due to technical reason.
 For the test sample does not have detail materials information provided by client, visually identical materials (e.g. wire insulation, solder points, etc.) will be considered as the same material.
 Solder points on a printing circuit board will be examined several times based on optical anomalies or discoloration of the solder point(s) unless the solder point(s) is obviously generated automatically during production.
 All other materials will be sampled and tested at one test point representatively.

XRF Screening limits for different matrices :

Material	Concentration (%)				
	Cd	Cr	Pb	Hg	Br
Polymeric	BL≤0.006<X<0.014≤ OL	BL≤0.064<X	BL≤0.067<X<0.133≤ OL	BL≤0.066<X< 0.134≤OL	BL≤0.029<X
Metallic	BL≤0.006<X<0.014≤ OL	BL≤0.064<X	BL≤0.067<X<0.133≤ OL	BL≤0.066<X< 0.134≤OL	n.a.
Composite materials	BL≤0.004<X<0.016≤ OL	BL≤0.044<X	BL≤0.047<X<0.153≤ OL	BL≤0.046<X< 0.154≤OL	BL≤0.024<X

Remark: The symbol "X" marks the region where further investigation is necessary.

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2.Cadmium, Lead, Chromium (VI), Mercury, Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE)

Test Method: Total Cadmium, Lead, Mercury, Chromium
 - Ref. to IEC 62321-4:2013+AMD1:2017 and IEC 62321-5:2013

Chromium (VI)
 - For Metal material - Ref. to IEC 62321-7-1:2015
 - For Polymer, Electronic material or others materials – Ref. to IEC 62321-7-2:2017

PBBs, PBDEs – Ref. to IEC 62321-6:2015

Test Result:

	Cd	Cr(VI)	Pb	Hg	PBBs	PBDEs
Maximum Permissible Limit (%)	0.01	0.1	0.1	0.1	0.1	0.1

Material No.	(%)					
	Cd	Cr [^]	Pb	Hg	PBBs	PBDEs
	RL (%)					
	0.001	0.001	0.001	0.001	0.01	0.01
A015	< RL	n.a.	15.1(*2)	n.a.	n.a.	n.a.

Material No.	Chromium VI content for metal materials (µg/cm²) (*1) RL: 0.10 µg/cm²
A005	Negative
A006	Negative
A008	Negative
A009	Negative
A023	Negative
A024	Negative
A028	Negative

Abbreviation:

Pb	= Lead
Cd	= Cadmium
Hg	= Mercury
Cr	= Chromium
Cr (VI)	= Chromium (VI)
PBBs	= Total Polybrominated Biphenyls
PBDEs	= Total Polybrominated Diphenyl Ethers
<	= Less than
RL	= Reporting Limit
n.a.	= Not Applicable
^	= The total Chromium have been determined
%	= percentage

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Remark:

- (*1) The Chromium (VI) content of metal sample in surface layer have been confirmed with reference to IEC 62321-7-1:2015 Annex.

	Chromium (VI) concentration	Qualitative result
Negative	$<0.1\mu\text{g}/\text{cm}^2$	The sample is negative (-ve) for Cr(VI). The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating
Inconclusive	$\geq 0.1\mu\text{g}/\text{cm}^2$ and $\leq 0.13\mu\text{g}/\text{cm}^2$	The result is considered to be inconclusive. Unavoidable coating variations may influence the determination. Recommendation: if additional samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trails for the final determination.
Positive	$>0.13\mu\text{g}/\text{cm}^2$	The sample is positive (+ve) for Cr(VI). Concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

- (*2) According to 2012/50/EU and Annex III of directive 2011/65/EU, Lead in the following electrical & electronic components is exempted from requirement.
 1. 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.

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3. BBP, DBP, DEHP, DIBP content

Test Method: ref. to IEC 62321-8:2017

Test Result:

	BBP	DBP	DEHP	DIBP
Maximum permissible Limit (%)	0.1	0.1	0.1	0.1

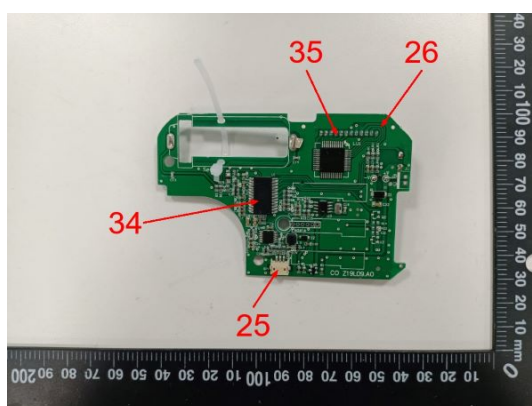
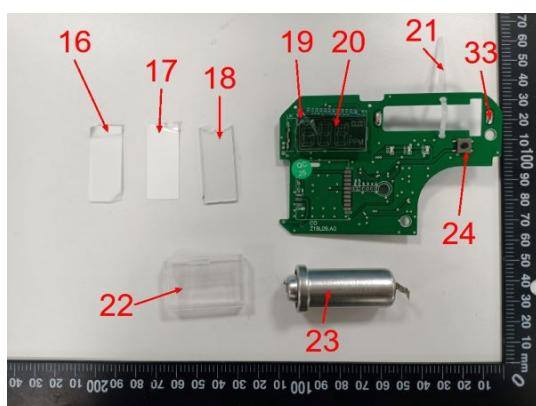
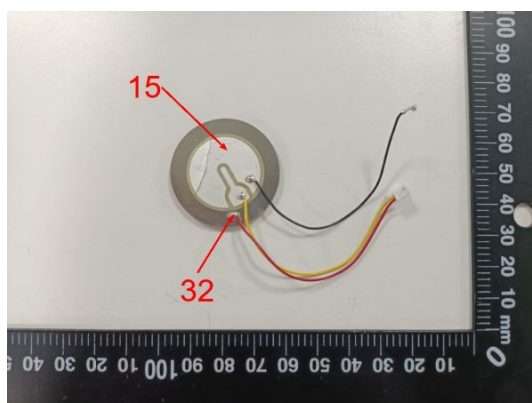
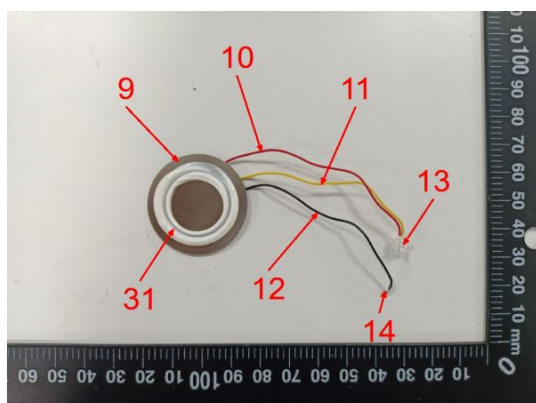
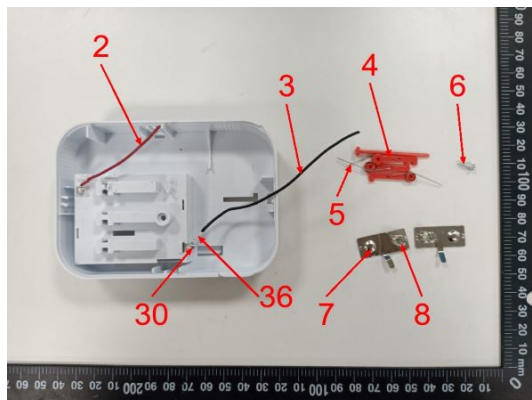
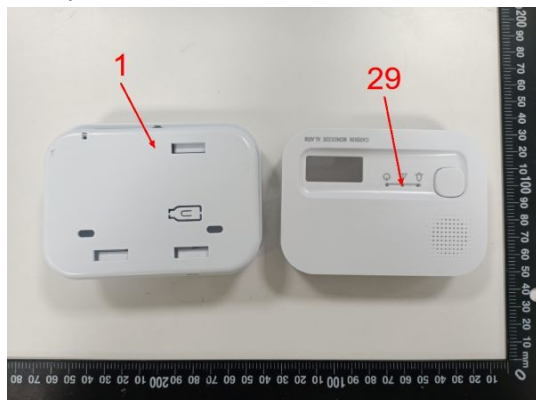
Test No.	Material No.	RL (%)			
		BBP	DBP	DEHP	DIBP
		RL (%)			
		0.005	0.005	0.005	0.005
T001	A001 + A004 + A013 + A021 + A022	< RL	< RL	< RL	< RL
T002	A002 + A003 + A010 + A011 + A012	< RL	< RL	< RL	< RL
T003	A016 + A017 + A018 + A020 + A029	< RL	< RL	< RL	< RL
T004	A025 + A026 + A027	< RL	< RL	< RL	< RL
T005	A031	< RL	< RL	< RL	< RL

Abbreviation: BBP= Benzylbutyl phthalate
 DBP= Dibutyl phthalate
 DEHP= Bis(2-ethylhexyl) phthalate
 DIBP= Diisobutyl phthalate
 < = less than
 RL = Reporting Limit
 %= percentage

Remark:

- * The maximum permissible limit is required from the amendment (EU) 2015/863 of RoHS Directive 2011/65/EU.

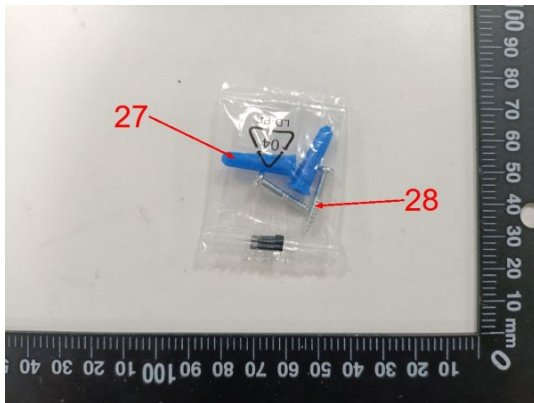
Sample Photos



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Sample Photos



- END -

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