

Test Report

No. HKTEC2405888004

Date: 06 Jan 2025

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The following sample(s) was/were submitted and identified on behalf of the clients as : LITHIUM MANGANESE DIOXIDE COIN CELL

SGS Job No. : 5510432 - HK

Colour : SILVERY

Item No Given by Client : CR927, CR1025, CR1130, CR1220, CR1225, CR1216, CR1616, CR1620, CR1625, CR1632, CR2016, CR2025, CR2032, CR2330, CR2354, CR2430, CR2450, CR2477

Manufacturer :

Country of Origin : CHINA

Country of Destination : EUROPE, USA

Date of Sample Received : 11 Dec 2024

Testing Period : 11 Dec 2024 - 03 Jan 2025

Test Requested : Selected test(s) as requested by client.

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Conclusion : The submitted battery sample does not exceed the limit mentioned in Annex I of Regulation (EU) 2023/1542– Heavy Metals Content in batteries and Waste batteries.

Based on the performed tests on submitted samples, the results comply with Canadian Environmental Protection Act (S.C. 1999, c. 33) , Products Containing Mercury Regulations (SOR/2014-254).

The submitted battery sample complies with the Mercury content requirements of the US Mercury - Containing Battery Management Act Public Law No 104-142 (1996).

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Signed for and on behalf of
SGS Hong Kong Limited.



Han Long Fung, Ivan
Chemist

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	HKT24-058880.019	Button cell
2	HKT24-058880.020	Silvery metal - Case
3	HKT24-058880.021	Core

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

Annex I of Regulation (EU) 2023/1542– Heavy Metals Content in batteries and Waste batteries

Test Method : Acid digestion method-CTS-EC-109-1. Analysis was performed by ICP-OES/ICP-MS/AAS.
(Decision Rule: please refer to appendix 1: Category 1)

Test Item(s)	Limit	Unit	MDL	019
Lead (Pb)	0.0100	%	0.0010	ND
Cadmium (Cd)	0.0020	%	0.0010	ND
Mercury (Hg)	0.0005	%	0.0001	ND
Conclusion	PASS			

Notes :

- (1) Results shown are of total weight of the battery sample.
- (2) From 18 August 2024, portable batteries, whether or not incorporated into appliances, shall not contain more than 0,01 % of lead (expressed as lead metal) by weight.
- (3) The restriction set out in point 2 shall not apply to portable zinc-air button cells until 18 August 2028.

Canadian Environmental Protection Act (S.C. 1999, c. 33) , Products Containing Mercury Regulations (SOR/2014-254) - Mercury (Hg)

Test Method : With reference to IEC 62321-4:2013, analysis was performed by ICP-OES/AAS/ICP-MS. (Decision Rule: please refer to appendix 1: Category 1)

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>020</u>	<u>021</u>
Mercury (Hg)	5	mg/kg	0.1	ND	ND
Conclusion				PASS	PASS

US Public law104-142

Test Method : Acid digestion method-CTS-EC-109-1. Analysis was performed by ICP-MS/AAS. (Decision Rule: please refer to appendix 1: Category 1)

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>019</u>
Mercury (Hg)	25	mg/cell	0.1	ND
Conclusion				PASS

Notes :

1. According to US Mercury-containing Battery Management Act, Public Law No.104-142(1996) SEC 203 the limitation on mercury content in alkaline-manganese button cell shall be 25 milligrams per button cell
2. MDL(Method Detection Limit) = 0.1mg/kg
3. Results shown are of total weight of the battery sample

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to SGS in-house method-CTS-EC-109-1, IEC62321-7-2:2017, IEC62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>019</u>
Cadmium (Cd)	100	mg/kg	10	ND
Lead (Pb)	1,000	mg/kg	10	ND
Mercury (Hg)	1,000	mg/kg	1	ND
Hexavalent Chromium (Cr(VI))	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>019</u>
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1,000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1,000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1,000	mg/kg	50	ND

Notes :

- (1) Quoted limit is referred to RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU. According to the document of Frequently Asked Questions on RoHS and WEEE published from European Commission in May 2005, the battery does not apply to RoHS Directive.
- (2) The measurement report of the expanded uncertainty with confident level 95% by coverage factor $k=2$, is 20% for each analyte of for Cd, Pb, Hg and Cr(VI).
- (3) The measurement report of the expanded uncertainty with confident level 95% by coverage factor $k=2$, is 30% for each analyte of for PBBs and PBDEs.
- (4) The measurement report of the expanded uncertainty with confident level 95% by coverage factor $k=2$, is 25% for each analyte of for DBP, BBP, DEHP and DIBP.

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Appendix 1

Category	Decision Rule Statement
1	The decision rule for conformity reporting is based on the non-binary statement with guard band (is equal to the expanded measurement uncertainty with a 95% coverage probability, $w = U95$) in ILAC-G8:09/2019 Clause 4.2.3. A. "Pass - the measured value is within (or below / above) the acceptance limit, where the acceptance limit is below / above to the guard band." or "Pass - The measured values were observed in tolerance at the points tested. The specific false accept risk is up to 2.5%." B. "Conditional Pass - The measured values were observed in tolerance at the points tested. However, a portion of the expanded measurement uncertainty intervals about one or more measured values exceeded / out of tolerance. When the measured result is close to the tolerance, the specific false accept risk is up to 50%." C. "Conditional Fail - One or more measured values were observed out of tolerance at the points tested. However, a portion of the expanded measurement uncertainty intervals about one or more measured values were in tolerance. When the measured result is close to the tolerance, the specific false reject risk is up to 50%." D. "Fail - the measured value is out of (or below / above) the tolerance limit added / subtracted to the guard band." or "Fail - One or more measured values were observed out of tolerance at the points tested". The specific false reject risk is up to 2.5%.
2	The decision rule for conformity reporting is based on EN 1811:2023: Reference test method for release of nickel from all post assemblies which are inserted into pierced parts of the human body and articles intended to come into direct and prolonged contact with the skin in Section 9.2 interpretation of results.
3	The decision rule for conformity reporting is based on the general consideration of simple acceptance as stated in ISO/IEC Guide 98-3: "Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM 1995)", and more specifically for analytical measurements to the EURACHEM/CITAC Guide 2012 "Quantifying Uncertainty in Analytical Measurement".
4	The decision rule for conformity reporting is according to the IEC 62321-7-1 Edition 1.0 2015-09 Section 7: Table 1 - (comparison to standard solutions and interpretation of result)
5	The decision rule for conformity reporting is according to the IEC 62321-3-1 Edition 1.0 2013-06 Annex A.3 interpretation of result.
6	The decision rule for conformity reporting is according to the GB/T 39560.701-2020 Section 7: Table 1 - (comparison to standard solutions and interpretation of result)
7	The decision rule for conformity reporting is according to the requested specification or standard (ASTM F963-23 section 4.3.5)
8	The decision rule for conformity reporting is according to the requested specification or standard (AS/NZS ISO 8124 Part 3 section 4.2)
9	The decision rule for conformity reporting is according to the GB/T 39560.301-2020 Annex A.3 interpretation of result
Remark	If the decision rule is not feasible to be used and the uncertainty of the result is able to be provided, the uncertainty range of the result will be shown in the report. Otherwise, only result will be shown in the report.

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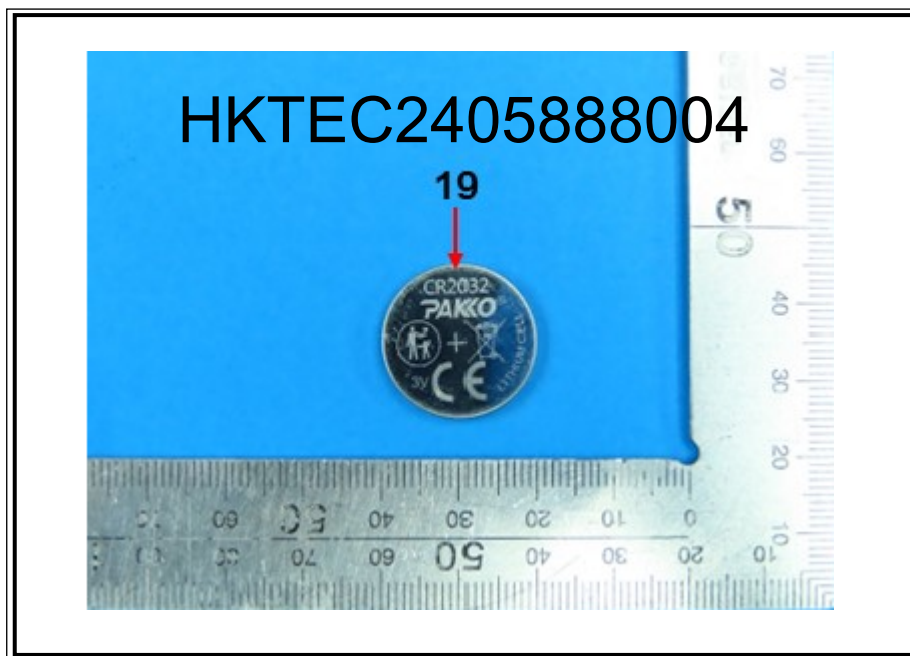
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Sample photo:



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