



Test Report

No.T32020211609SC

Date: FEB 10, 2020

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The following samples were submitted and identified on behalf of the client as:

1.5 VOLT 0.% HG MERCURY FREE ALKALINE ZINC MANGANESE BUTTON CELL

SGS Case No. : CA320202127309
Style / Item No. : G 13/LR44/357/A76, LR44 (EXP), LR44 (HG.PB) G 12/ LR43/386/186, G 11/LR721/362/162, G 10/LR1130/389/189, G 9/ LR936/394/194, G 8/LR1120/ 391/191, G7 / LR927/395/195, G6 /LR920 /371/171, G5 /LR754/ 393/193, G4 / LR626/377/177, G3/ LR41 / 393/192, G2/ LR726/SR726/ 196, G1/LR621/364/164, G 0/LR521/SR521, LR932, LR732, LR632
Sample Receiving Date : JAN 21, 2020
Test Performing Date : JAN 21 - 31, 2020

Table with 2 columns: Test Requested, Conclusion. Rows include European Directive 2006/66/EC, US Public Law 104-142, European RoHS Directive 2015/863/EU, and Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) Content.

***** FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S) *****

Signed for and on behalf of
SGS Hong Kong Ltd.

Handwritten signature of Henry Cheung

Cheung Cheuk Fung, Henry
Assistant Operations Manager



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Test Results:

1. European Directive 2006/66/EC and its amendments (Directive 2013/56/EU) – Lead, Cadmium and Mercury Content

Method: With reference to IEC 62321-4:2013, IEC 62321-5:2013

Analysis was performed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) / Atomic Absorption Spectrometer (AAS) / Direct Mercury Analyzer (DMA)

For Button Cells

Test Item(s)	Lead (Pb)	Cadmium (Cd)	Mercury (Hg)
MDL (%)	0.001	0.001	0.0001
Labeling requirement (%)	> 0.004	> 0.002	--
Permissible Limit (%)	--	0.002	0.0005
Specimen Description	Result(s) (%)		
1. Silvery metal (LR-41 button cell)	ND	ND	ND

- Note:
- % = percentage by weight
 - ND = Not Detected (lower than MDL)
 - 1% = 10000 mg/kg = 10000 ppm
 - > = greater than

2. US Public Law 104-142 (1996) Title II – Mercury-Containing Battery Management Act – Mercury Content

Method: IEC 62321-4:2013

Analysis was performed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) / Direct Mercury Analyzer (DMA)

For Alkaline Manganese Button Cell

Test Item(s)	Mercury (Hg)
MDL (mg/cell)	10
Permissible Limit (mg/cell)	25
Specimen Description	Result(s) (mg/cell)
1. Silvery metal (LR-41 button cell)	ND

- Note:
- mg/cell = milligram per cell
 - ND = Not Detected (lower than MDL)

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3.1) EU Directive 2015/863/EU amending Annex II to Directive 2011/65/EU (RoHS, Previously 2002/95/EC) - Wet Chemical

Method :

For Lead, Cadmium : With reference to IEC 62321-5:2013, analysis was performed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) / Atomic Absorption Spectrometer (AAS).

For Mercury : With reference to IEC 62321-4:2013+AMD1:2017, analysis was performed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES).

For PBB and PBDEs : With reference to IEC 62321-6:2015, analysis was performed by Gas Chromatography Mass Spectrometer (GC-MS)

For Chromium (VI) : With reference to IEC 62321-7-1:2015, analysis was performed by Ultraviolet Visible Spectrophotometer (UV-Vis)

Test Item(s)	Result (mg/kg)	MDL (mg/kg)	Permissible Limit (mg/kg)
	1		
Lead (Pb)	ND	2	1000
Cadmium(Cd)	ND	2	100
Mercury (Hg)	ND	2	1000
Hexavalent Chromium by spot test / boiling water extraction (Cr(VI))	Negative	#	#
Sum of PBBs	ND	--	1000
Monobromobiphenyl	ND	5	--
Dibromobiphenyl	ND	5	--
Tribromobiphenyl	ND	5	--
Tetrabromobiphenyl	ND	5	--
Pentabromobiphenyl	ND	5	--
Hexabromobiphenyl	ND	5	--
Heptabromobiphenyl	ND	5	--
Octabromobiphenyl	ND	5	--
Nonabromobiphenyl	ND	5	--
Decabromobiphenyl	ND	5	--
Sum of PBDEs	ND	--	1000
Monobromodiphenyl ether	ND	5	--
Dibromodiphenyl ether	ND	5	--
Tribromodiphenyl ether	ND	5	--
Tetrabromodiphenyl ether	ND	5	--
Pentabromodiphenyl ether	ND	5	--
Hexabromodiphenyl ether	ND	5	--
Heptabromodiphenyl ether	ND	5	--
Octabromodiphenyl ether	ND	5	--
Nonabromodiphenyl ether	ND	5	--
Decabromodiphenyl ether	ND	5	--
Comment	PASS	--	--

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Specimen Description:

1. Silvery metal (LR-41 button cell)

- Note:
- mg/kg = milligram per kilogram
 - MDL = Method Detection Limit
 - ND = Not Detected (lower than MDL)
 - .# = Negative means the absence of CrVI on the tested areas; Positive means the presence of CrVI on the tested areas. The detected CrVI concentration in the boiling-water-extraction solution is equal to or greater than 0.02 mg/kg with 50cm² sample surface area.
 - The maximum permissible limit is quoted from the EU Directive 2015/863/EU amending Annex II to Directive 2011/65/EU.

3.2) EU Directive 2015/863/EU amending Annex II to Directive 2011/65/EU (RoHS, Previously 2002/95/EC) - Phthalates Content

Method: With reference to IEC 62321-8:2017
 Analysis was performed by Gas Chromatography Mass Spectrometer (GC-MS)

Test Item(s)	CAS No.	Result(s) (mg/kg)	MDL (mg/kg)	Permissible Limit (mg/kg)
Specimen No.	--	1		
Dibutyl Phthalate (DBP)	84-74-2	ND	50	1000
Benzylbutyl Phthalate (BBP)	85-68-7	ND	50	1000
Bis-(2-ethylhexyl) Phthalate (DEHP)	117-81-7	ND	50	1000
Diisobutyl phthalate (DIBP)	84-69-5	ND	50	1000

Specimen Description:

1. Silvery metal (LR-41 button cell)

- Note:
- mg/kg = milligram per kilogram
 - ND = Not Detected (lower than MDL)
 - MDL = Method Detection Limit
 - 1% = 10000 mg/kg = 10000 ppm

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Sample Photo:



Photo provided by client



Tested sample



Photo provided by client

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*** End of Report ***

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