



# TEST REPORT

LAB NO. 报告号 : (5216)104-0081  
DATE 日期 : April 19, 2016  
PAGE 页码 : 1 OF 10

APPLICANT :  
申请人公司名称

CONTACT PERSON : /  
联系人名称

DATE OF SUBMISSION : April 13, 2016  
样品收取日期

TEST PERIOD : April 13, 2016 – April 19, 2016  
所需工作周期

NO. OF WORKING DAY(S) : 5  
所需工作日

LCIE REF NO. : /

SAMPLE DESCRIPTION : MERCURY FREE ALKALINE BUTTON CELL (CONVEX)  
样品描述  
Model no.: AG0 / L521C / 379 / LR63 / LR521; AG1 / L621C / 364 / LR60 / LR621; AG2 / L726C / 396 / LR59 / LR726; AG3 / L736C / 392 / LR41 / LR736; AG4 / L626C / 377 / LR66 / LR626; AG5 / L754C / 393 / LR48 / LR754; AG6 / L921C / 370 / LR69 / LR921; AG7 / L926C / 395 / LR57 / LR926 / LR927; AG8 / L1121C / 391 / LR55 / LR1121 / LR1120; AG9 / L936C / 394 / LR45 / LR936; AG10 / L1131C / 390 / LR54 / LR1131 / LR1130; AG11 / L721C / 344 / LR58 / LR721; AG12 / L1142C / 386 / LR43 / LR1142; AG13 / L1154C / 357 / LR44 / LR1154  
Country of Origin: China

## SUMMARY OF TEST RESULTS 测试结果摘要

TEST REQUESTED 测试项目	PASS 通过	FAIL 不通过	REMARK 备注
Restriction of Hazardous Substances Directive (RoHS), 2011/65/EU 有关欧洲针对电子产品的指令(电子电器禁用某些有害物质指令), 2011/65/EU	X		
Mercury Content - US Public Law 104-142, Title II	X		
Total Mercury Content in Battery and Button Cell Battery - Canadian Environmental Protection Act, S.C. 1999, c. 33, Products Containing Mercury Regulations SOR/2014-254, Section 3	X		
Heavy Metals Content in Batteries and Accumulators and Waste Batteries and Accumulators – Button Cells – European Council Directive 2006/66/EC with the amendment Directive 2013/56/EU	X		

LA

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**REMARK**

If there are questions or concerns on this report, please contact:

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BUREAU VERITAS HONG KONG LTD.

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MR. VINCENT WONG  
SECTION MANAGER, ANALYTICAL



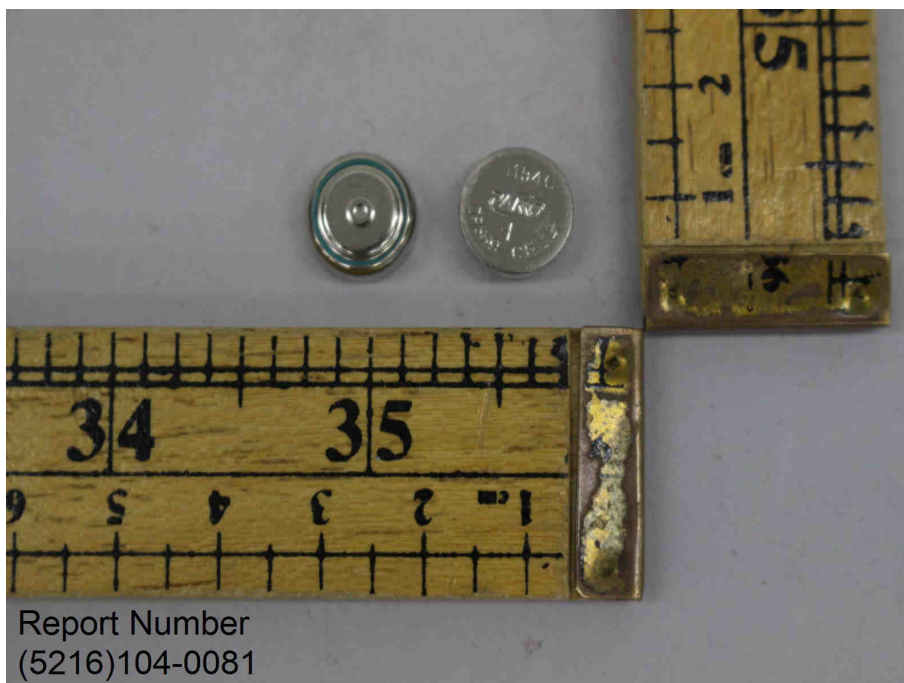
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**Photo of the Submitted Sample**

**递交样品照片**





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**TEST RESULT 测试结果**

**Restriction of Hazardous Substances Directive (RoHS), 2011/65/EU**

有关欧洲针对电子产品的指令（电子电器禁用某些有害物质指令），2011/65/EU

Compounds 化合物	Tested item 测试项目 (ppm)	RoHS' Limits RoHS' 建议最高界限 (ppm)
	1	
Lead 铅 (Pb)	12.9	1000
Mercury 汞 (Hg)	ND	1000
Cadmium 镉 (Cd)	ND	100
Chromium VI 六价铬 (Cr VI)	ND	1000
Polybrominated Biphenyls 多溴联苯 (PBBs) :		
Bromobiphenyls 一溴联苯	ND	
Dibromobiphenyls 二溴联苯	ND	
Tribromobiphenyls 三溴联苯	ND	
Tetrabromobiphenyls 四溴联苯	ND	
Pentabromobiphenyls 五溴联苯	ND	
Hexabromobiphenyls 六溴联苯	ND	
Heptabromobiphenyls 七溴联苯	ND	
Octabromobiphenyls 八溴联苯	ND	
Nonabromobiphenyls 九溴联苯	ND	
Decabromobiphenyl 十溴联苯	ND	
Sum of PBBs 多溴联苯总和	ND	1000
Polybrominated Diphenyl Ethers 多溴联苯醚 (PBDEs) :		
Bromodiphenyl ethers 一溴联苯醚	ND	
Dibromodiphenyl ethers 二溴联苯醚	ND	
Tribromodiphenyl ethers 三溴联苯醚	ND	
Tetrabromodiphenyl ethers 四溴联苯醚	ND	
Pentabromodiphenyl ethers 五溴联苯醚	ND	
Hexabromodiphenyl ethers 六溴联苯醚	ND	
Heptabromodiphenyl ethers 七溴联苯醚	ND	
Octabromodiphenyl ethers 八溴联苯醚	ND	
Nonabromodiphenyl ethers 九溴联苯醚	ND	
Decabromodiphenyl ether 十溴联苯醚	ND	
Sum of PBDEs 多溴联苯醚总和	ND	1000

Tested Item 测试项目	Conclusion 结论
1) Silvery button cell (Mercury Free Alkaline Button Cell (Convex))	PASS 通过



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Note / Key 注释:

ppm = mg/kg 百万分之一      < = less than 少于      ND = not detected 不被检出      NA = not applicable 不适用  
Negative = 阴性      Positive = 阳性      NR = not requested 没有要求  
Pb = Lead 铅      Hg = Mercury 汞      Cd = Cadmium 镉      Cr = Chromium 铬  
Br = Bromine 溴      PBBs = Polybrominated Biphenyls 多溴联苯      PBDEs = Polybrominated Diphenyl Ethers 多溴联苯醚  
Detection Limit 检出限 (mg/kg) :  
Each (Pb, Cd, Hg & Cr VI) 2; Each PBBs 50; Each PBDEs 50  
各 (铅, 镉, 汞和六价铬) 2; 各多溴联苯 50; 各多溴联苯醚 50

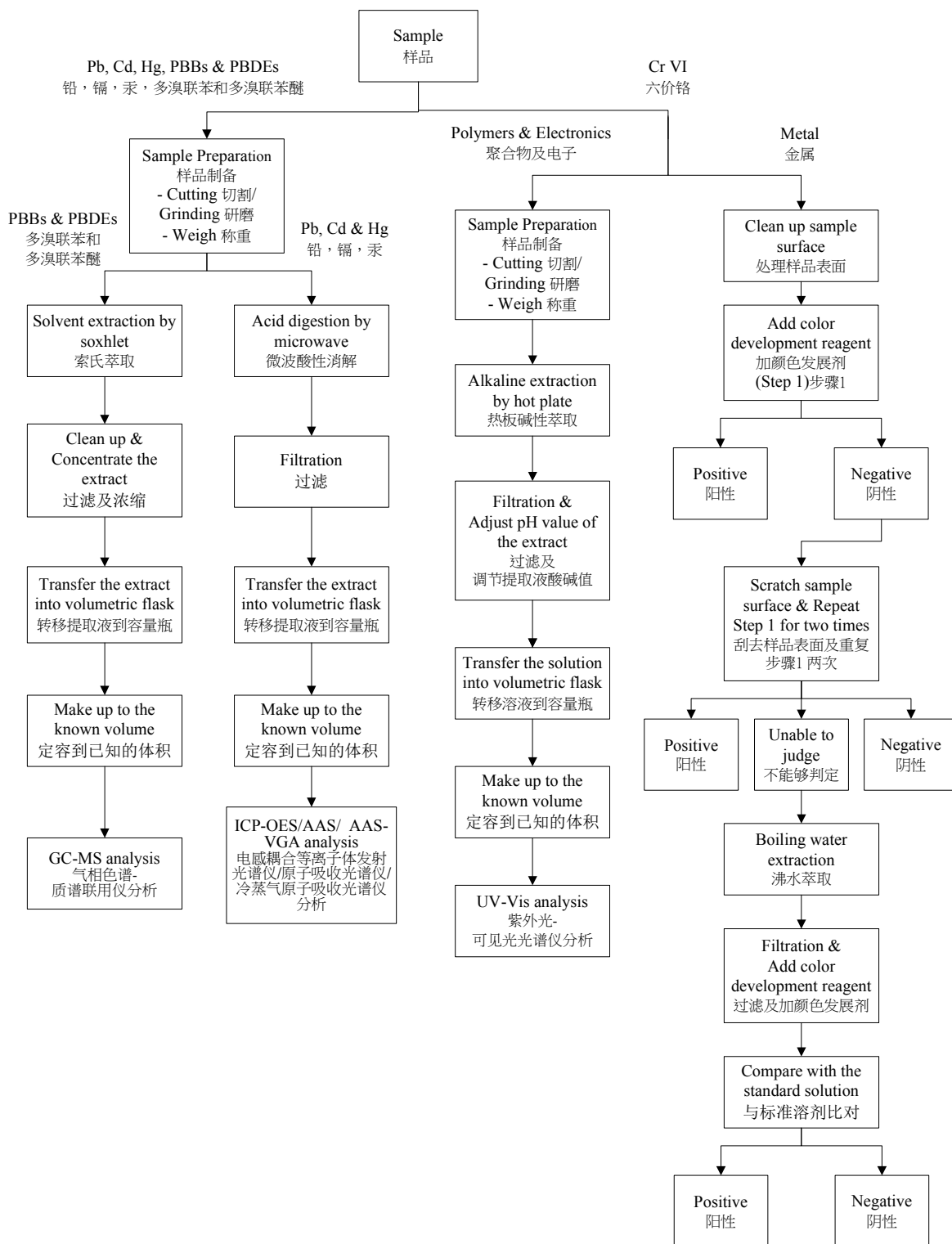
Remark 备注:

- The list of analytes is summarized in table of Appendix.  
分析物列表 – 见附录。
- The test flowchart of heavy metals and flame retardants content is listed in table of Appendix.  
重金属和阻燃剂含量的测试流程图 – 见附录。
- According to European Council Directive 2011/65/EU, Article 5 “Adaptation of the Annexes to scientific and technical progress”, exemption(s) should be granted to the materials and components of Test Item(s) in the lists in Annexes III and IV of this directive.  
根据欧盟委员会 2011/65/EU 指令中，条款 5 “适应科学技术进步的附件”，附件 III 和 IV 中列明的测试项目中的材料和部件可予以豁免。



## APPENDIX 附录

List of Analytes and their Corresponding Test Methods [ European Council Directive 2011/65/EU ] : 分析物名单及其相应的测试方法 [ 欧盟委员会指令 2011/65/EU ]:		
No.	Name of Analytes 分析物名称	Test Method(s) 测试方法
1	Lead (Pb) 铅	With reference to EN 62321: 2009, Clauses 8, 9 and 10. 参照 EN 62321: 2009, Clauses 8, 9 and 10.
2	Cadmium (Cd) 镉	
3	Mercury (Hg) 汞	With reference to EN 62321: 2009, Clause 7. 参照 EN 62321: 2009, Clause 7.
4	Chromium VI (Cr VI) 六价铬	<u>Metal 金属:</u> With reference to EN 62321: 2009, Annex B <sup>[a]</sup> . 参照 EN 62321: 2009, Annex B <sup>[a]</sup> . <u>Polymers &amp; Electronics 聚合物及电子:</u> With reference to EN 62321: 2009, Annex C. 参照 EN 62321: 2009, Annex C.
5	Polybromobiphenyls (PBBs) 多溴联苯 - Bromobiphenyl (MonoBB) - Dibromobiphenyl (DiBB) - Tribromobiphenyl (TriBB) - Tetrabromobiphenyl (TetraBB) - Pentabromobiphenyl (PentaBB) - Hexabromobiphenyl (HexaBB) - Heptabromobiphenyl (HeptaBB) - Octabromobiphenyl (OctaBB) - Nonabromobiphenyl (NonaBB) - Decabromobiphenyl (DecaBB)	With reference to EN 62321: 2009, Annex A. 参照 EN 62321: 2009, Annex A.
	Polybromodiphenyl ethers (PBDEs) 多溴联苯醚 - Bromodiphenyl ether (MonoBDE) - Dibromodiphenyl ether (DiBDE) - Tribromodiphenyl ether (TriBDE) - Tetrabromodiphenyl ether (TetraBDE) - Pentabromodiphenyl ether (PentaBDE) - Hexabromodiphenyl ether (HexaBDE) - Heptabromodiphenyl ether (HeptaBDE) - Octabromodiphenyl ether (OctaBDE) - Nonabromodiphenyl ether (NonaBDE) - Decabromodiphenyl ether (DecaBDE)	
[a]	The principle of this method was evaluated and supported by two studies organized by IEC TC 111 WG3. These studies were focused on detecting the presence of Cr VI in the corrosion protection coatings on metallic samples. 该方法的原理是在由 IEC TC111 WG3 组织的两次研究中得到了充分评估并获得了认可。这些研究侧重于对金属样品上防腐涂层中六价铬的存在的检测(定性测试)。	

**APPENDIX 附录 – TEST PROCESS 测试程序**



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### TEST RESULT

#### Mercury Content - US Public Law 104-142, Title II

Parameter	Battery Type	Unit	Result
			<b>1</b>
Total Mercury (Hg)	II	mg/ cell	<5
<b>Conclusion</b>	-	-	PASS

Test Item 1: Silvery button cell (Mercury Free Alkaline Button Cell (Convex))

Note: “<” = less than

Limit of Mercury:

Battery Type	Battery	Maximum Allowable Limit
I	Alkaline Manganese Battery	Not be intentionally introduced
II	Alkaline Manganese Button Cell	<25mg/cell
III	Zinc-Carbon Battery	Not be intentionally introduced

Method: Sample was digested with acid mixtures and then analyzed by Atomic Absorption Spectrometer.

#### Total Mercury Content in Battery and Button Cell Battery - Canadian Environmental Protection Act, S.C. 1999, c. 33, Products Containing Mercury Regulations SOR/2014-254, Section 3

Tested Item(s) : 1 Silvery button cell (Mercury Free Alkaline Button Cell (Convex))

Limit :	Prohibited <sup>[b]</sup> ( Less than 0.0005 % )			
-	Unit	Result		
<b>Test Item(s)</b>	-	1	-	-
<b>Parameter</b>	-	-	-	-
Total Mercury (Hg)	%	ND	-	-
<b>Conclusion</b>	-	PASS	-	-

Note / Key :

ND = Not detected

“>” = Greater than

% = percent

Detection Limit (%) : 0.0001

Remark :

- <sup>[b]</sup> denoted as this limit is valid to button cell battery starting from January 1, 2016. Button cell battery manufactured or imported before January 1, 2016 has to comply with another total mercury requirement with the maximum allowable limit of 25 milligrams per cell according to Canadian Environmental Protection Act, S.C. 1999, c. 33, Products Containing Mercury Regulations SOR/2014-254, Schedule, Item 31 and labeling requirement as specified in Canadian Environmental Protection Act, S.C. 1999, c. 33, Products Containing Mercury Regulations SOR/2014-254, Sections 8 and 9
- Test Item(s) with total mercury content less than 0.0005 % should be considered as exempted as specified in Canadian Environmental Protection Act, S.C. 1999, c. 33, Products Containing Mercury Regulations SOR/2014-254, Section 2, Items (l) and (m).





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### TEST RESULT

**Heavy Metals Content in Batteries and Accumulators and Waste Batteries and Accumulators – Button Cells – European Council Directive 2006/66/EC with the amendment Directive 2013/56/EU**

Parameter	Unit	Result	Maximum Allowable Limit
		1	
Total Lead (Pb)	% w/w	0.001	See comment if > 0.004 %
Total Cadmium (Cd)	% w/w	< 0.0005	0.002 %
Total Mercury (Hg)	% w/w	< 0.0001	2.0 % See comment if > 0.0005 %
Conclusion	-	PASS	Please see comment for proper marking of the battery

Test Item 1: Silvery button cell (Mercury Free Alkaline Button Cell (Convex))

Note: % w/w = percentage weight by weight  
ppm = parts per million  
“<” = less than  
“>” = more than

Method: Sample was digested with acid mixture and then analyzed by Inductively Coupled Argon Plasma Spectrometer.

Comment:

1. Marking requirement:

According to 2006/66/EC, all batteries, accumulators and battery packs shall be appropriately marked with the symbol as below:



Covered area on battery, accumulator or battery pack

- Cylindrical cells: 1.5 % of surface area (maximum 5 × 5 cm)
- Others: 3 % of surface area of the largest side (maximum 5 × 5 cm)
- When the size of the battery, accumulator or battery pack is such that the symbol would be smaller than 0.5 × 0.5 cm, a symbol at least 1 × 1 cm shall be printed on the packaging. Symbols shall be printed visibly, legibly and indelibly

2. When the sample consists of mercury from 0.0005% to 2.0% or lead exceeding 0.004%, the product is to be labeled with heavy metal content with the requirements as below:

- Mark with the chemical symbol for the metal concerned: Hg or Pb
- Print beneath the symbol
- Cover an area of at least ¼ of the size of the symbol

1. According to Directive 2013/56/EU, starting from 2015 Oct 1<sup>st</sup>, the limit of mercury will be lowered to 0.0005%.

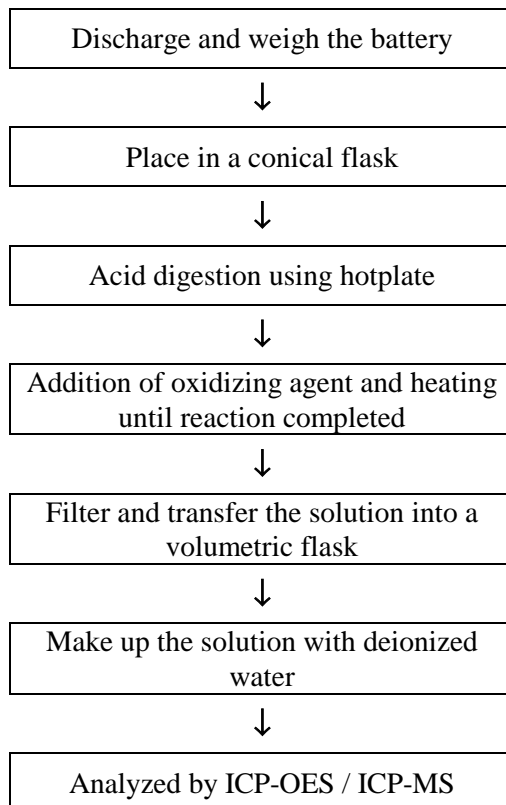


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### APPENDIX – TEST PROCESS



END