



TEST REPORT

**BUREAU
VERITAS**

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 1 OF 13

APPLICANT : NANTONG FUJITSU MICROELECTRONICS CO., LTD
NO.288, CHONGCHUAN ROAD, NANTONG, JIANGSU, CHINA

申请人公司名称 : 南通富士通微电子股份有限公司
江苏省南通市崇川路 288 号

DATE OF SUBMISSION : April 29, 2010
样品收取日期 : 2010 年 4 月 29 日

TEST PERIOD : April 29, 2010 to May 5, 2010
所需工作周期 : 2010 年 4 月 29 日至 2010 年 5 月 5 日

NO. OF WORKING DAY(S) : 4
所需工作日 : 4

SAMPLE DESCRIPTION : One (1) received sample stated to be SOT89
样品描述

TESTED ITEM 1 : Silvery metal

TESTED ITEM 2 : Black plastic

SUMMARY OF TEST RESULTS

TEST REQUESTED	PASS	FAIL	REMARK
Heavy Metals Test and Flame Retardants Test - Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC 重金属测试和燃烧延缓剂测试-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), 2002/95/EC	√		
Perfluorooctane Sulphonates Content – European Directive 2006/122/EC 全氟辛酸磺酰基化合物含量-2006/122/EC	√		
Perfluorooctanoic Acid Content 全氟辛酸含量			See results in page 8 结果见第 8 页
Halogen content 卤素含量测试			See results in page 9 结果见第 9 页
Total Antimony Content 总锑含量测试			See results in page 10 结果见第 10 页

REMARK/备注

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

若有任何疑问或咨询, 可通过下述联络方式与我们联系

General enquiry and invoicing

其他问题

Technical enquiry

技术问题

顾晶/许祥晖 小姐 Ms. Michelle Gu/Lucy Xu

(021) 24166888*6837/6842

Michelle.gu@cn.bureauveritas.com/ Lucy.xu @cn.bureauveritas.com

郭晖轩/云大陆 先生 Mr. Kevin Guo/ Darryl Yun

(021) 24166888*6856/6836

Kevin.guo@cn.bureauveritas.com/Darryl.yun@cn.bureauveritas.com

BUREAU VERITAS

CONSUMER PRODUCTS SERVICES DIVISION (SHANGHAI)

必维国际检验集团 - 上海中美商品检测有限公司

PREPARED BY : King

制定:

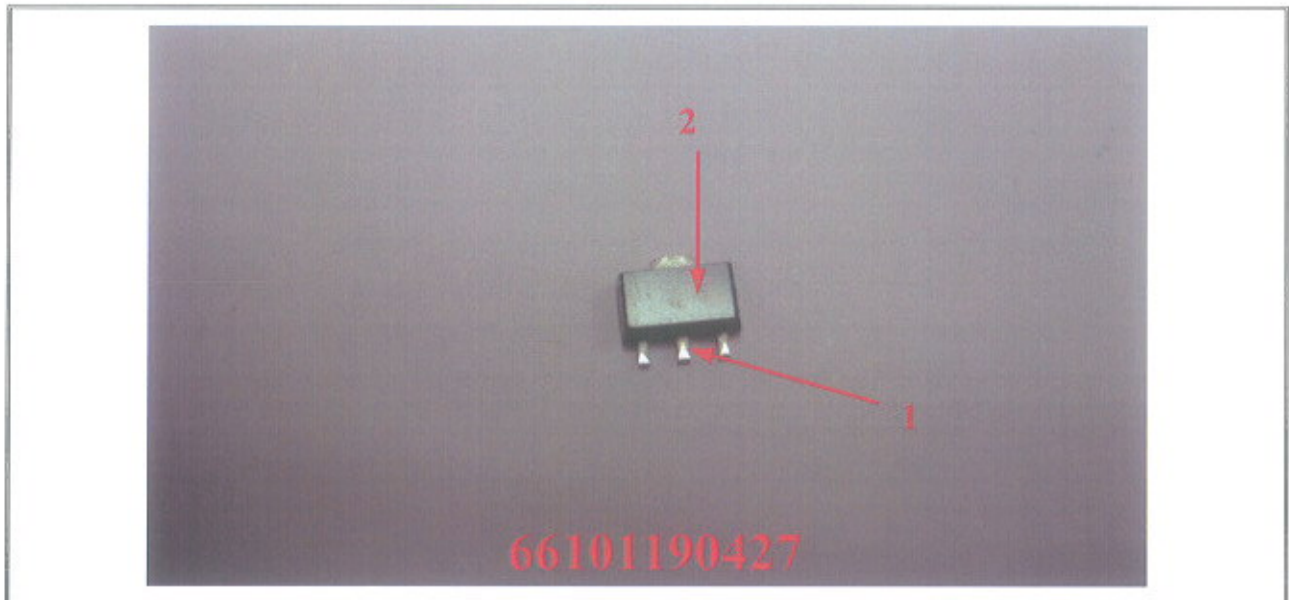
郭晖轩/Kevin Guo

化学实验室技术经理

CHEMICAL LABORATORY TECHNOLOGY MANAGER

RW/2010

Photo of the Submitted Sample





BUREAU
VERITAS

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 3 OF 13

TEST RESULT 测试结果

I. Heavy Metals Test and Flame Retardants Test - Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC

I. 重金属测试和燃烧延缓剂测试-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), 2002/95/EC

Compounds 化合物	Tested item 测试项目 (mg/kg)	RoHS' Limits RoHS' 建议最高界限 (mg/kg)
	1	
Lead 铅 (Pb)	21.0	1000
Mercury 汞 (Hg)	ND	1000
Cadmium 镉 (Cd)	ND	100
Chromium VI 六价铬 (Cr VI)	Negative ²⁾	Negative

Tested Item 测试项目	Conclusion 结论
1) Silvery metal	PASS 通过



BUREAU
VERITAS

TEST RESULT 测试结果

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 4 OF 13

I. Heavy Metals Test and Flame Retardants Test - Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC

I. 重金属测试和燃烧延缓剂测试-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), 2002/95/EC

Compounds 化合物	Tested item 测试项目 (mg/kg)		RoHS' Limits
	2		RoHS' 建议最高界限 (mg/kg)
Lead 铅 (Pb)	ND		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		
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		

Tested Item 测试项目	Conclusion 结论
2) Black plastic	PASS 通过



BUREAU
VERITAS

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 5 OF 13

Note / 注释:

Detection limits for regulated substances and limit of RoHS (in mg/kg) reference to 2002/95/EC

Regulated Substances 受限物质	Detection limit 检测限	RoHS' Limit (mg/kg) RoHS' 建议最高界限
Pb 铅	2	1000
Hg 汞	2	1000
Cd 镉	2	100
Cr VI 六价铬	2	1000
PBBs 多溴联苯 <i>Bromobiphenyls</i> <i>Dibromobiphenyls</i> <i>Tribromobiphenyls</i> <i>Tetrabromobiphenyls</i> <i>Pentabromobiphenyls</i> <i>Hexabromobiphenyls</i> <i>Heptabromobiphenyls</i> <i>Octabromobiphenyls</i> <i>Nonabromobiphenyls</i> <i>Decabromobiphenyl</i>	5 (each)	1000 (sum)
PBDEs 多溴联苯醚 <i>Bromodiphenyl ethers</i> <i>Dibromodiphenyl ethers</i> <i>Tribromodiphenyl ethers</i> <i>Tetrabromodiphenyl ethers</i> <i>Pentabromodiphenyl ethers</i> <i>Hexabromodiphenyl ethers</i> <i>Heptabromodiphenyl ethers</i> <i>Octabromodiphenyl ethers</i> <i>Nonabromodiphenyl ethers</i> <i>Decabromodiphenyl ether</i>	5 (each)	1000 (sum)

mg/kg= ppm 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

Test Method / 测试方法:

Wet Chemistry Tests – Reference to IEC 62321:2008, "Electrotechnical Products- Determination of Levels of Six Regulated Substances": 湿化学方法 – 参照 IEC 62321:2008, 电子电器产品中六种限用物质浓度测定

- i. Lead (Pb) and Cadmium (Cd): The sample is comminuted and digested with acid mixtures. Pb/ Cd contents are determined with ICP-AES technique. (Chapter 8, 9 & 10)
铅和镉: 先将样品粉碎, 然后用混酸消解。铅/镉的含量由等离子发射光谱仪测定 (第 8, 9 和 10 章)。
- ii. Mercury (Hg): The sample is comminuted and digested with acid mixtures. Hg content is determined with ICP-AES, ICP-MS or AAS-VGA technique. (Chapter 7)
汞: 先将样品粉碎, 然后用混酸消解。汞含量由离子发射光谱仪, 或者原子吸收分光光度计-氢化物发生装置测定。(第 7 章)
- iii. Chromium (VI) (Cr VI) 六价铬:
 - A. Metal: Qualitative method for the presence of hexavalent chromium on metal surface on "Test for the presence of Hexavalent Chromium (Cr (VI)) in colourless and coloured corrosion-protection coatings on metals". The presence of hexavalent chromium is indicated by the formation of a red to violet color. The method is applied in turn to 1) untreated surface; 2) surface got by gently rubbing to scratch possibly reduced chromate surface but without completely removing the whole coating layer; 3) surface got by forcibly scratching into the deeper layers, even reaching the substrate. The sample is further verified by boiling water extraction method if the result of spot test shows ahead is negative or uncertain. (Annex B)
金属: 金属表面六价铬存在的定性方法“金属表面无色和有腐蚀防护涂层中六价铬 (Cr VI) 的测试”。测试颜色呈红-紫色, 则表明六价铬的存在。该方法适用于 1) 未磨损过的表面; 2) 轻微磨损过的表面, 以去除可能被还原的铬酸盐表层, 但不去除整个镀层; 3) 用力磨损的镀层表面, 甚至于基材表面。如果以上点测试结果呈阴性或无法确定, 则用沸水萃取方法作进一步确认。(附录 B)
 - B. Plastics & Electronics: The sample is comminuted and digested with alkaline mixtures. Chromium VI content is determined with UV-VIS spectroscopic technique. (Annex C)
塑料和电子器件: 先将样品粉碎, 然后用混碱消解。六价铬含量由紫外可见分光光度计测定。(附录 C)
- iv. PBBs and PBDEs: The sample extracted by appropriate solvent is used for extraction and quantified GC-MS. (Annex A)
多溴联苯和多溴联苯醚: 将样品用合适溶液进行提取, 再由气相色谱-质谱联用仪测定。(附录 A)

Remark / 备注:

1. For Chromium VI of a metal composite sample by wet chemistry, each individual metal component was tested.
湿化学方法测试复合金属样品中六价铬时, 每一个金属部分均被测试。
2. Negative means hexavalent chromium on the tested areas does not be detected at the time of testing.
阴性结果表示测试时测试表面六价铬未被检出。
3. Positive means the presence of hexavalent chromium on the tested area. If the test result is positive, that means the Cr(VI) concentration detected in the spot-test solution is equal to or greater than 1 mg/kg or if use boiling-water extraction, the concentration is equal to or greater than 0.02mg/kg/50cm². However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.
阳性结果表示测试表面存在六价铬。如果测试结果呈阳性, 说明在点测试溶液中六价铬的浓度等于或大于 1mg/kg, 或用水煮法时六价铬的浓度等于或大于 0.02mg/kg/50cm²。但这不应当作为样品镀层中六价铬的浓度, 也不应当用作方法检出限, 这只是一种定性的测试方法。



**BUREAU
VERITAS**

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 6 OF 13

4. The results of lead, Cadmium, Mercury, PBB and PBDE of the tested item(s) meet the requirement of the EU directive 2002/95/EC(RoHS); and for the metallic sample with corrosion protection coating, the exact hexavalent chromium concentration of the surface coating cannot be determined by this qualitative test method (see remark 2 ahead) directly; so whether the tested item(s) meet(s) the EU directive RoHS or not, further confirmation and analysis should be done.
检测项目中铅,镉,汞,多溴联苯和多溴联苯醚的含量符合欧盟 RoHS 限量要求.对有腐蚀防护镀层的金属样品,镀层表面的六价铬准确含量则无通过此定性方法确定;若需确定是否符合欧盟 RoHS,需要进一步确认和分析。
5. The result relates only to the tested item. The report shall not be reproduced except full without the written approval of the testing laboratory. Parameters which are not covered by the lab's testing scope are subcontracted to laboratories with government approval. The accreditation relates to competences given in the accreditation certificate.
测试结果仅代表被测样品。未经实验室书面许可,此报告不可被复制。对于本实验室未能涵盖的测试项目,实验室可以分包给其它政府承认的实验室。分包实验室的能力验证会在验证证书中注明。



BUREAU
VERITAS

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 7 OF 13

ANNEX

List of Exempted Specific Applications in RoHS Directive (The list will be updated accordingly if EC updates it) 欧盟 RoHS 指令豁免项(豁免内容将跟随欧盟变化而变化)

1. Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
2. Mercury in straight fluorescent lamps for general purposes not exceeding:
 - halophosphate 10 mg
 - triphosphate with normal lifetime 5 mg
 - triphosphate with long lifetime 8 mg.
3. Mercury in straight fluorescent lamps for special purposes.
4. Mercury in other lamps not specifically mentioned in this Annex.
5. Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
6. Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminium containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
7. Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead),
 - Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunications,
 - Lead in electronic ceramic parts (e.g. piezoelectric devices). ◀ [R3]
8. Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations. ◀ [R3]
9. Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators. 9b. Lead in lead-bronze bearing shells and bushes. ◀ [A2]
10. Within the procedure referred to in Article 7(2), the Commission shall evaluate the applications for:
 - Deca BDE,
 - Mercury in straight fluorescent lamps for special purposes,
 - Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications (with a view to setting a specific time limit for this exemption), and
 - Light bulbs, as a matter of priority in order to establish as soon as possible whether these items are to be amended accordingly.
11. Lead used in compliant pin connector systems. ◀ [A3]
12. Lead as a coating material for the thermal conduction module c-ring. ◀ [A3]
13. Lead and cadmium in optical and filter glass. ◀ [A3]
14. Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight. ◀ [A3]
15. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip Packages. ◀ [A3]
16. Lead in linear incandescent lamps with silicate coated tubes. ◀ [A4]
17. Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications. ◀ [A4]
18. Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb). ◀ [A4]
19. Lead with PbBiSn-Hg and PblSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL). ◀ [A4]
20. Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD). ◀ [A4]
21. Lead and cadmium in printing inks for the application of enamels on borosilicate glass. ◀ [A6]
22. Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communication systems until 31 December 2009. ◀ [A9]
23. Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames. ◀ [A6]
24. Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors. ◀ [A6]
25. Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes. ◀ [A6]
26. Lead oxide in the glass envelope of Black Light Blue (BLB) lamps. ◀ [A6]
27. Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers. ◀ [A6]
28. Hexavalent chromium in corrosion preventive coatings of unpainted metal sheetings and fasteners used for corrosion protection and Electromagnetic Interference Shielding in equipment falling under category three of Directive 2002/96/EC (IT and telecommunications equipment). Exemption granted until 1 July 2007. ◀ [A7] (Over now)
29. Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC. ◀ [A5]
For the purposes of Article 5(1)(a), a maximum concentration value of 0,1 % by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0.01 % by weight in homogeneous materials for cadmium shall be tolerated. ◀ [A1]
30. Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more. ◀ [A8]
31. Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting). ◀ [A8]
32. Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes. ◀ [A8]
33. Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers. ◀ [A10]
34. Lead in cermet-based trimmer potentiometer elements. ◀ [A10]
35. Cadmium in photoresistors for optocouplers applied in professional audio equipment until 31 December 2009. ◀ [A10]
36. Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display until 1 July 2010. ◀ [A10]
37. Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body. ◀ [A10]
38. Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide. ◀ [A10]
39. Cadmium in colour-converting II-VI LEDs (< 10 µg Cd per mm² of light-emitting area) for use in solid state illumination or display systems until 1 July 2014. ◀ [A12]

Note:

Sentences within ► ◀ are the amendments

A = Added by R = Replacement specified in

1= 2005/618/EC	2= 2005/717/EC	3= 2005/747/EC	4= 2006/310/EC	5= 2006/690/EC	6= 2006/691/EC	7= 2006/692/EC
8= 2008/385/EC	9= 2009/428/EC	10= 2009/443/EC	11= 2008/35/EC	12= 2010/122/EU		



BUREAU
VERITAS

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 8 OF 13

TEST RESULT 测试结果

II. Perfluorooctane Sulphonates Content – European Directive 2006/122/EC

II. 全氟辛烷磺酸-2006/122/EC

Parameter	Unit	Result		Maximum Allowable Limit
		1	2	
Perfluorooctane Sulphonates (PFOS)	%	<0.0001	<0.0001	0.1
Conclusion	-	PASS	PASS	-

Test Item 1: Silvery metal

Test Item 2: Black plastic

Note: "<" = less than
PFOS as C₈F₁₇SO₂X was determined.

Method: Sample was extracted with organic solvent and then analyzed by Liquid Chromatograph Mass Spectrometer.

方法: 用有机溶剂萃取样品, 然后用液相色谱质谱联用仪进行分析

III. Perfluorooctanoic Acid Content

III. 全氟辛酸含量

Parameter	Unit	Result		Laboratory Report Limit
		1	2	
Perfluorooctanoic Acid (PFOA)	%	ND	ND	0.0001

Test Item 1: Silvery metal

Test Item 2: Black plastic

Note: ND = Not detected (Concentration of analyte lower than the laboratory reporting limit)

Method: Sample was extracted with organic solvent and then analyzed by Liquid Chromatography Mass Spectrometer.

方法: 用有机溶剂萃取样品, 然后用液相色谱质谱联用仪进行分析



BUREAU
VERITAS

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 9 OF 13

TEST RESULT 测试结果

IV. Halogen (fluorine, chlorine, bromine, iodine) content

IV. 卤素 (氟、氯、溴、碘) 含量

Compounds 化合物	Unit 单位	Result 结果	Laboratory Report Limit 实验室报告界限
		2	
Fluorine 氟	mg/kg	ND	100
Chlorine 氯	mg/kg	ND	50
Bromine 溴	mg/kg	ND	50
Iodine 碘	mg/kg	ND	100

Tested Item 2: 测试项目 2:	Black plastic
----------------------------------	----------------------

Note: mg/kg=milligram per kilogram
注释: mg/kg=毫克每千克
“<” = less than
“<” = 小于
Fluorine 氟/ Iodine 碘“ND” = less than 100 mg/kg
Chlorine 氯/ Bromine 溴“ND” = less than 50 mg/kg

Method: Sample was firstly combusted and absorbed with solvent, then analyzed by ion chromatography
(reference to EN14582:2007 or IEC61189-2:2006).
方法: 将样品燃烧后用溶剂吸收, 然后用离子色谱仪分析。
(参照 EN14582:2007 或 IEC61189-2:2006)



LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 10 OF 13

TEST RESULT 测试结果

V. Total Antimony Content

V. 总锑含量测试

Compounds 化合物	Tested item (mg/kg) 测试项目(mg/kg)	Laboratory Reporting Limit (mg/kg) 实验室报告界限 (mg/kg)
	2	
Antimony (Sb) 锑(Sb)	ND	10

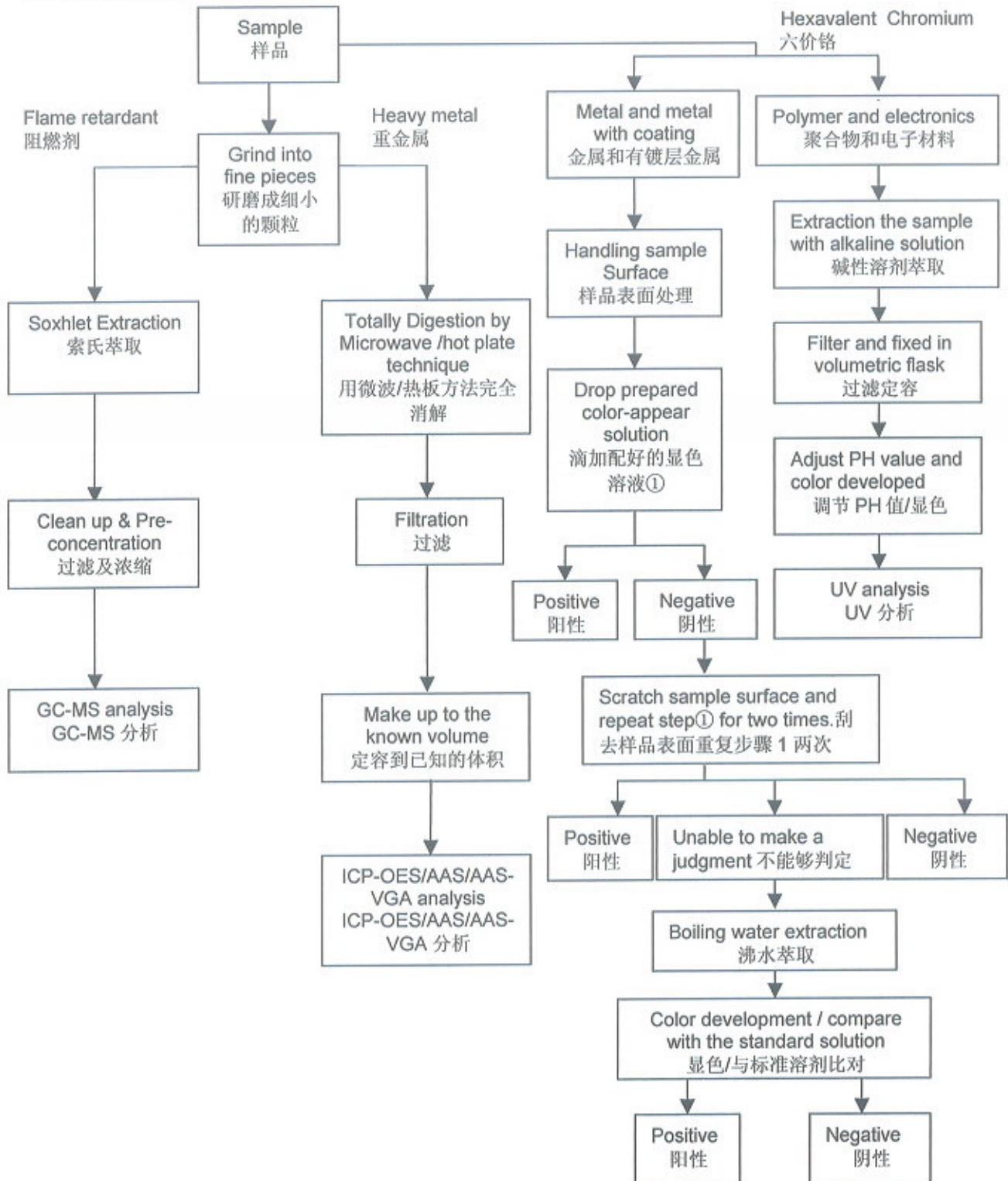
Tested Item 2: 测试项目 2:	Black plastic
----------------------------------	----------------------

Remarks:	Test methods: The sample is comminuted and digested with acid mixtures. Sb content is determined with ICP-AES technique (Reference: US EPA 3050B/3051/3052) ND = Not detected
----------	---

END

附录

Test Procedures Flow Chart for the determination of RoHS(total heavy metals, Hexavalent Chromium and flame retardants)





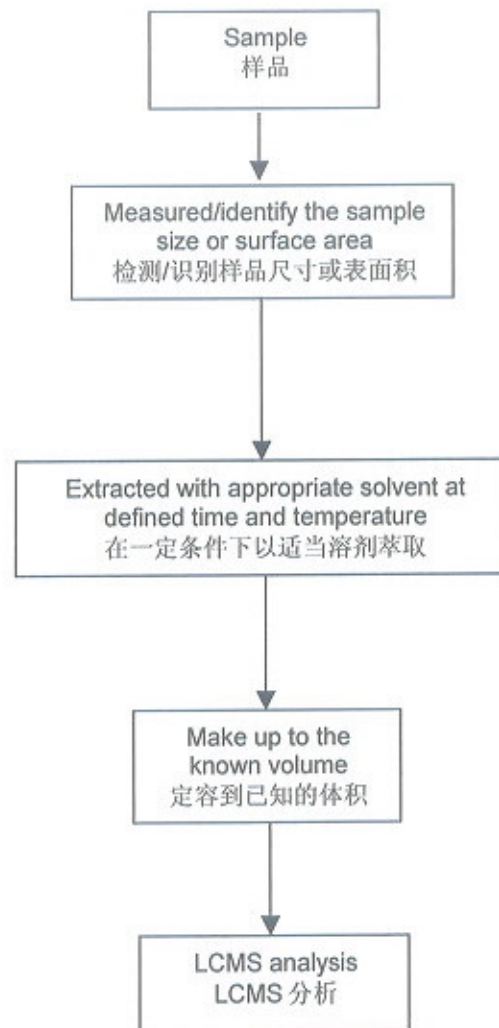
BUREAU
VERITAS

LAB NO. : (6610)119-0427
DATE : May 5, 2010
PAGE : 12 OF 13

APPENDIX

附录

Test Procedures Flow Chart for the determination of PFOA and PFOS



APPENDIX

附录

Test Procedures Flow Chart for the determination of Halogen 卤素测试流程图

