



**BUREAU
VERITAS**

TEST REPORT

LAB NO. : (6611)144-1266
DATE : May 24, 2011
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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 : May 4, 2011
样品收取日期 : 2011 年 5 月 4 日

TEST PERIOD : May 4, 2011 to May 9, 2011
所需工作周期 : 2011 年 5 月 4 日至 2011 年 5 月 9 日

NO. OF WORKING DAY(S) : 4
所需工作日 : 4

SAMPLE DESCRIPTION : One (1) received sample stated to be TSSOP8NT
样品描述

TESTED ITEM 1 : Silvery metal

SUMMARY OF TEST RESULTS

TEST REQUESTED	PASS	FAIL	REMARK
Heavy Metals Test - Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC 重金属测试-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 全氟辛烷磺酰基化合物含量-2006/122/EC	√		
Perfluorooctanoic Acid Content 全氟辛酸含量			See results in page 7 结果见第 7 页
Total Beryllium Content 总铍含量测试			See results in page 7 结果见第 7 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

顾晶/许祥晖 小姐 Ms. Michelle Gu/Lucy Xu

其他问题

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CONSUMER PRODUCTS SERVICES DIVISION (SHANGHAI)

必维国际检验集团-必维申美商品检测(上海)有限公司

PREPARED BY : Michelle
制定:


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电子电器分析部实验室经理
Electrical & Electronic Analytical LABORATORY MANAGER

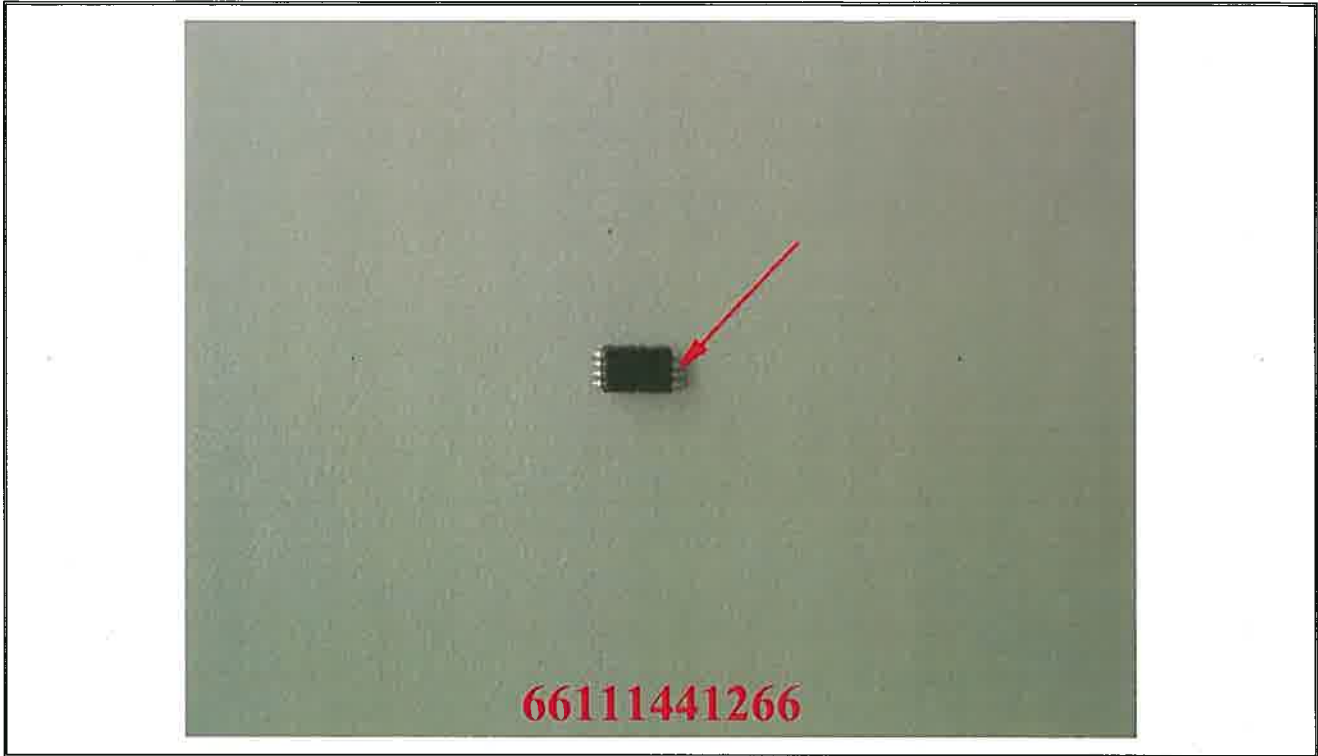
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Photo of the Submitted Sample





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TEST RESULT 测试结果

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

I. 重金属测试-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)	13.3	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



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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 Bromobiphenyls Dibromobiphenyls Tribromobiphenyls Tetrabromobiphenyls Pentabromobiphenyls Hexabromobiphenyls Heptabromobiphenyls Octabromobiphenyls Nonabromobiphenyls Decabromobiphenyl	5 (each)	1000 (sum)
PBDEs 多溴联苯醚 Bromodiphenyl ethers Dibromodiphenyl ethers Tribromodiphenyl ethers Tetrabromodiphenyl ethers Pentabromodiphenyl ethers Hexabromodiphenyl ethers Heptabromodiphenyl ethers Octabromodiphenyl ethers Nonabromodiphenyl ethers Decabromodiphenyl ether	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受限物质浓度测定

- 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“金属表面无色和有色腐蚀防护涂层中六价铬 (Cr VI) 的测试”。测试颜色呈红一紫色, 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。



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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。



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ANNEX-List of Exempted Specific Applications in RoHS Directive (2010/571/EU).

Exemption	Scope and dates of applicability
1 Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	
1(a) For general lighting purposes < 30 W: 5 mg	Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011 until 31 December 2012; 2,5 mg shall be used per burner after 31 December 2012
1(b) For general lighting purposes ≥ 30 W and < 50 W: 5 mg	Expires on 31 December 2011; 3,5 mg may be used per burner after 31 December 2011
1(c) For general lighting purposes ≥ 50 W and < 150 W: 5 mg	
1(d) For general lighting purposes ≥ 150 W: 15 mg	
1(e) For general lighting purposes with circular or square structural shape and tube diameter < 17 mm	No limitation of use until 31 December 2011; 7 mg may be used per burner after 31 December 2011
1(f) For special purposes: 5 mg	
2(a) Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):	
2(a)(1) Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 5 mg	Expires on 31 December 2011; 4 mg may be used per lamp after 31 December 2011
2(a)(2) Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 5 mg	Expires on 31 December 2011; 3 mg may be used per lamp after 31 December 2011
2(a)(3) Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8): 5 mg	Expires on 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
2(a)(4) Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 5 mg	Expires on 31 December 2012; 3,5 mg may be used per lamp after 31 December 2012
2(a)(5) Tri-band phosphor with long lifetime (≥ 25 000 h): 8 mg	Expires on 31 December 2011; 5 mg may be used per lamp after 31 December 2011
2(b) Mercury in other fluorescent lamps not exceeding (per lamp):	
2(b)(1) Linear halophosphate lamps with tube > 28 mm (e.g. T10 and T12): 10 mg	Expires on 13 April 2012
2(b)(2) Non-linear halophosphate lamps (all diameters): 15 mg	Expires on 13 April 2016
2(b)(3) Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
2(b)(4) Lamps for other general lighting and special purposes (e.g. induction lamps)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
3 Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):	
3(a) Short length (≤ 500 mm)	No limitation of use until 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
3(b) Medium length (> 500 mm and ≤ 1 500 mm)	No limitation of use until 31 December 2011; 5 mg may be used per lamp after 31 December 2011
3(c) Long length (> 1 500 mm)	No limitation of use until 31 December 2011; 13 mg may be used per lamp after 31 December 2011
4(a) Mercury in other low pressure discharge lamps (per lamp)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
4(b) Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60:	
4(b)-I P ≤ 155 W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011
4(b)-II 155 W < P ≤ 405 W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(b)-III P > 405 W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(c) Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	
4(c)-I P ≤ 155 W	No limitation of use until 31 December 2011; 25 mg may be used per burner after 31 December 2011
4(c)-II 155 W < P ≤ 405 W	No limitation of use until 31 December 2011; 30 mg may be used per burner after 31 December 2011
4(c)-III P > 405 W	No limitation of use until 31 December 2011; 40 mg may be used per burner after 31 December 2011
4(d) Mercury in High Pressure Mercury (vapour) lamps (HPMV)	Expires on 13 April 2015
4(e) Mercury in metal halide lamps (MH)	
4(f) Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex	
5(a) Lead in glass of cathode ray tubes	
5(b) Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	
6(a) Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0,35 % lead by weight	
6(b) Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	
6(c) Copper alloy containing up to 4 % lead by weight	
7(a) Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)	
7(b) Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications	
7(c)-I Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound	
7(c)-II Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	
7(c)-III Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013
8(a) Cadmium and its compounds in one shot pellet type thermal cut-offs	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012
8(b) Cadmium and its compounds in electrical contacts	
9 Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution	
9(b) Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	
11(a) Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b) Lead used in other than C-press compliant pin connector systems	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013
12 Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
13(a) Lead in white glasses used for optical applications	
13(b) Cadmium and lead in filter glasses and glasses used for reflectance standards	
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	Expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011
15 Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	
16 Lead in linear incandescent lamps with silicate coated tubes	Expires on 1 September 2013
17 Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications	
18(a) Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba) 2 MgSi 2 O 7 :Pb)	Expires on 1 January 2011
18(b) 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 (BaSi 2 O 5 :Pb)	
19 Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL)	Expires on 1 June 2011
20 Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)	Expires on 1 June 2011
21 Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	
23 Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010
24 Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	
25 Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring	
26 Lead oxide in the glass envelope of black light blue lamps	Expires on 1 June 2011
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	Expired on 24 September 2010
29 Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (1)	
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	
31 Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)	
32 Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	
33 Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers	
34 Lead in cermet-based trimmer potentiometer elements	
36 Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010
37 Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	
38 Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39 Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm 2 of light-emitting area) for use in solid state illumination or display systems	Expires on 1 July 2014



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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	
Perfluorooctane Sulphonates (PFOS)	%	<0.0001	0.1
Conclusion	-	PASS	-

Test Item 1: Silvery metal

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	
Perfluorooctanoic Acid (PFOA)	%	ND	0.0001

Test Item 1: Silvery metal

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

IV. Total Beryllium Content

IV. 总铍含量测试

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)
	1	
Beryllium (Be) 铍(Be)	ND	10

Test Item 1: Silvery metal

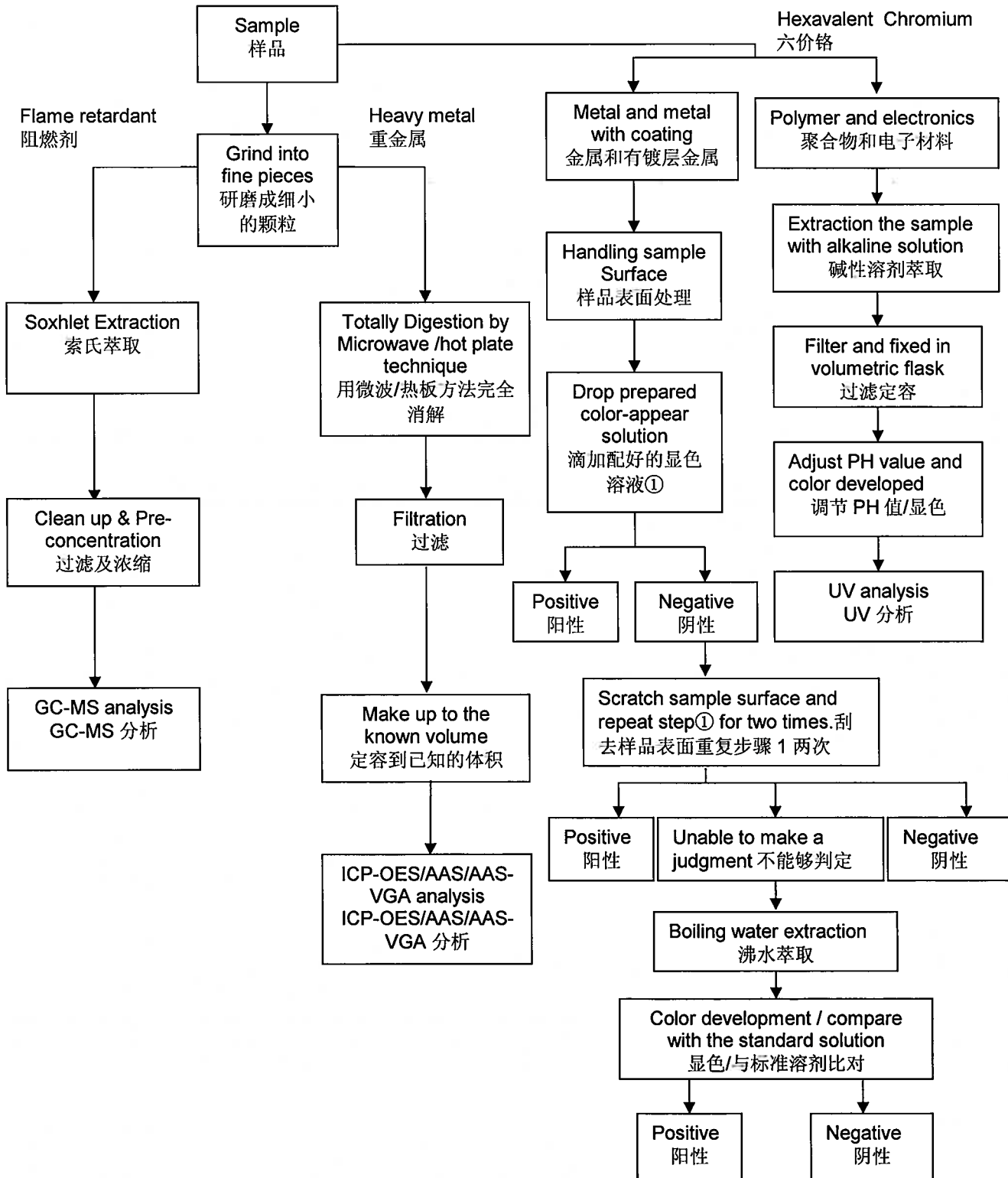
Test methods:	The sample is comminuted and digested with acid mixtures. Be content is determined with ICP-AES technique (Reference: US EPA 3050B/3051/3052) ND = Not detected
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END

APPENDIX

附录

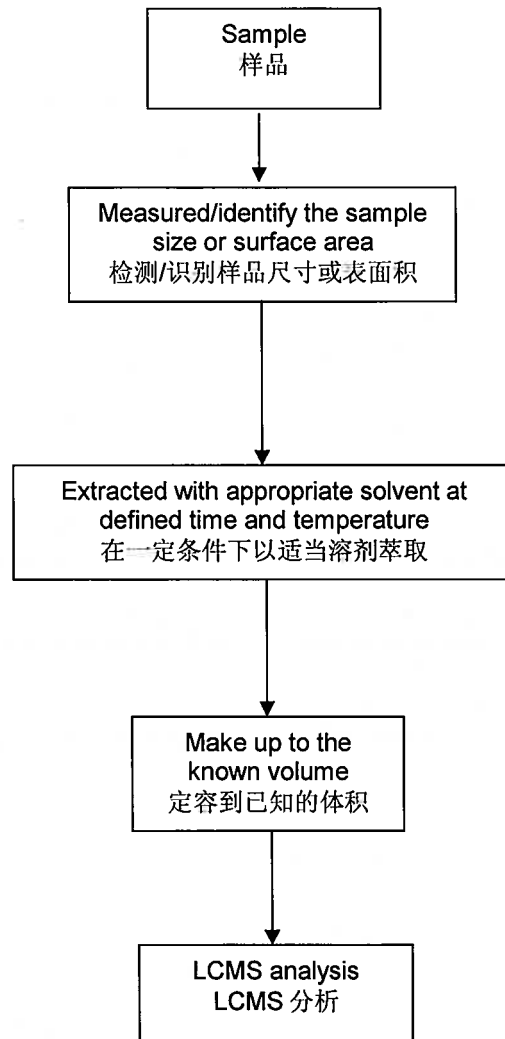
Test Procedures Flow Chart for the determination of RoHS (total heavy metals, Hexavalent Chromium and flame retardants)





APPENDIX
附录

Test Procedures Flow Chart for the determination of PFOA and PFOS



APPENDIX 附录

Flow chart of determination of heavy metals using different test methods

