



**BUREAU
VERITAS**

TEST REPORT

LAB NO. : (6611)129-1270
DATE : May 16, 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 9, 2011
样品收取日期 : 2011 年 5 月 9 日

TEST PERIOD : May 9, 2011 to May 16, 2011
所需工作周期 : 2011 年 5 月 9 日至 2011 年 5 月 16 日

NO. OF WORKING DAY(S) : 6
所需工作日 : 6

SAMPLE DESCRIPTION : One (1) received sample stated to be SOT23-6
样品描述

TESTED ITEM 1 : Metal and non-metal part

SUMMARY OF TEST RESULTS

TEST REQUESTED	CONCLUSION
Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC	PASS
Perfluorooctane Sulphonates Content – European Directive 2006/122/EC	PASS
Perfluorooctanoic Acid Content	See results in page 7
Total Beryllium Content & Total Antimony Content	See results in page 7
Halogen (Chlorine, Bromine) Content	See results in page 8
Phthalate Test	See results in page 8
Dimethyl Fumarate content	See results in page 9
Formaldehyde Content – reference to ISO14184 part 1	See results in page 9
Polyvinyl Chloride (PVC) Identification	See results in page 9
Organotin Compounds Content	See results in page 9
Azo Dyes Content (Analysis of Amines in Dyestuff) – Regulation (EC) No. 1907/2006 Annex XVII Item No. 43	See results in page 10
Production Check on SVHC – Cobalt dichloride & Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (SCCP)	PASS

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

顾晶/许祥晖 小姐 Ms. Michelle Gu/Lucy Xu

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Technical enquiry

技术问题

余克刚/郭晔轩 先生 Mr. Gorden.Yu/ Kevin Guo

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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:

郭晔轩 Kevin Guo

电子电器分析部实验室经理

Electrical & Electronic Analytical LABORATORY MANAGER

RW/2011



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Photo of the Submitted Sample





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TEST RESULT 测试结果

I. Restriction of Hazardous Substances Directive (RoHS), 2002/95/EC

I. 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)	38.3		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
1) Metal and non-metal part	PASS 通过

Remark: 1) The tested part of the sample was specified by client.
 2) The test conclusion was given based on the results of tested part.



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Note / 注释:

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

Table with 3 columns: Regulated Substances 受限物质, Detection limit 检测限, RoHS' Limit (mg/kg) RoHS' 建议最高界限. Rows include Pb, Hg, Cd, Cr VI, PBBs, and PBDEs with their respective limits.

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)
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)
iii. Chromium (VI) (Cr VI) 六价铬: A. Metal: Qualitative method for the presence of hexavalent chromium on metal surface... B. Plastics & Electronics: The sample is comminuted and digested with alkaline mixtures...
iv. PBBs and PBDEs: The sample extracted by appropriate solvent is used for extraction and quantified GC-MS. (Annex A)

Remark / 备注:

- 1. For Chromium VI of a metal composite sample by wet chemistry, each individual metal component was tested.
2. Negative means hexavalent chromium on the tested areas does not be detected at the time of testing.
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.



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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).

Table with 3 columns: Exemption, Scope and dates of applicability. Rows include exemptions for mercury, lead, cadmium, and hexavalent chromium in various electronic components and materials.



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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: Metal and non-metal part

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

Remark: 1) The tested part of the sample was specified by client.
2) The test conclusion was given based on the results of tested part.

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: Metal and non-metal part

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 & Total Antimony Content

IV. 总铍和总锑含量测试

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)
	1	
Beryllium (Be) 铍 (Be)	ND	10
Antimony (Sb) 锑 (Sb)	ND	10

Test Item 1: Metal and non-metal part

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

V. Halogen (Chlorine, Bromine) Content

V. 卤素（氯、溴）含量

Parameter	Unit	Result	Laboratory Report Limit
		1	
Chlorine	mg/kg	ND	50
Bromine	mg/kg	ND	50

Test Item 1: Metal and non-metal part

Note: mg/kg=milligram per kilogram

注释: mg/kg=毫克每千克

“<” = less than

“<” = 小于

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).

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)

VI. Phthalate Test

VI. 邻苯二甲酸盐测试

Parameter	CAS No.	Unit	Result
			1
Dibutyl phthalate (DBP)	84-74-2	%	<0.005
Butyl benzyl phthalate (BBP)	85-68-7	%	<0.005
Di-2-ethylhexyl phthalate (DEHP)	117-81-7	%	<0.005
Di-n-octyl phthalate (DNOP)	117-84-0	%	<0.005
Di-iso-decyl phthalate (DIDP)	26761-40-0	%	<0.005
Di-iso-nonyl phthalate (DINP)	28553-12-0	%	<0.005
Di-n-hexyl phthalate (DHP)	84-75-3	%	<0.005

Test Item 1: Metal and non-metal part

Remark: ND = Not detected (Concentration below 0.005%)

备注: ND = 未检出 (含量小于 0.005%).

Results reported in percentage

报告结果采用百分比

Method: Extraction with solvent, analysed by Gas Chromatography Mass Spectrometer.

方法: 用溶液萃取样品, 并用气相色谱-质谱联用仪分析。



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TEST RESULT 测试结果

VII. Dimethyl Fumarate content

Parameter	Unit	Result
		1
Dimethyl Fumarate	mg/kg	<0.03

Test Item 1: Metal and non-metal part

Note: mg/kg = milligram per kilogram

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

VIII. Formaldehyde Content – reference to ISO14184 part 1

Tested part:	1) Metal and non-metal part	
	Standard	Result [ppm]
1	Test Method: ISO14184 part 1	ND

Remarks: 1) ND = Not detected, which concentration of formaldehyde is below 20.0 ppm

2) The test method was specified by client.

IX. Polyvinyl Chloride (PVC) Identification

Test Method: Beilstein test and Fourier Transform Infrared Spectroscopy (FT-IR) with or without chemical separation.

Tested Item 1: Metal and non-metal part

Tested Item(s)	Result	Conclusion
1	PVC free	DATA

X. Organotin Compounds Content

Organotin	Tested item (mg/kg)		Laboratory reporting limit (mg/kg)
	1		
Tributyltin (TBT)	ND		0.050
Tripropyltin (TPT)	ND		0.050
Dibutyltin (DBT)	ND		0.050
Diocetyl tin (DOT)	ND		0.050

Tested Item 1: Metal and non-metal part

Note: ND = Not detected (Concentration of analyte lower than the laboratory reporting limit)
 mg/kg = milligrams per kilogram

Method: DIN 38407-13



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TEST RESULT 测试结果

XI. Azo Dyes Content (Analysis of Amines in Dyestuff) – Regulation (EC) No. 1907/2006 Annex XVII Item No. 43

Parameter	CAS-No	Unit	Result	Maximum Allowable Limit
			I	
o-Toluidine	95-53-4	mg/kg	<10.0	30
2-Methoxyaniline	90-04-0	mg/kg	<10.0	30
p-Chloroaniline	106-47-8	mg/kg	<10.0	30
p-Kresidine	120-71-8	mg/kg	<10.0	30
2,4,5-Trimethylaniline	137-17-7	mg/kg	<10.0	30
4-Chloro-o-Toluidine	95-69-2	mg/kg	<10.0	30
2,4-Toluylenediamine	95-80-7	mg/kg	<10.0	30
2,4-Diaminoanisoole	615-05-4	mg/kg	<10.0	30
2-Naphthylamine	91-59-8	mg/kg	<10.0	30
2-Amino-4-nitrotoluene	99-55-8	mg/kg	<10.0	30
4-Aminodiphenyl	92-67-1	mg/kg	<10.0	30
p-Aminoazobenzene	60-09-03	mg/kg	<10.0*	30
4,4'-Oxydianiline	101-80-4	mg/kg	<10.0	30
Benzidine	92-87-5	mg/kg	<10.0	30
4,4'-Diaminodiphenylmethane	101-77-9	mg/kg	<10.0	30
o-Aminoazotoluene	97-56-3	mg/kg	<10.0	30
3,3'-Dimethyl-4,4'-diaminodiphenylmethane	838-88-0	mg/kg	<10.0	30
3,3'-Dimethylbenzidine	119-93-7	mg/kg	<10.0	30
4,4'-Thiodianiline	139-65-1	mg/kg	<10.0	30
3,3'-Dichlorobenzidine	91-94-1	mg/kg	<10.0	30
4,4'-Methylene-bis-(2-chloraniline)	101-14-4	mg/kg	<10.0	30
3,3'-Dimethoxybenzidine	119-90-4	mg/kg	<10.0	30
Conclusion	-	-	PASS	

Test Item	Description	Test Method
1	Metal and non-metal part	EN 14362-1 EN 14362-2

Note: mg/kg = milligram per kilogram

“<” = less than

“>” = more than

Method: EN 14362-1: 2003 incorporating Corrigendum 2005 – For textile with azo colorants accessible without extraction

EN 14362-2: 2003 incorporating Corrigendum 2005 – For textile with azo colorants accessible by extracting the fibers

The azo dyes were analyzed by Gas Chromatograph Mass Spectrometer and confirmed by Liquid Chromatograph with Diode Array Detector.

- Remark:
- 1) *Azo colorants that are able to form p-aminoazobenzene, generate aniline and 1,4-phenylenediamine under the condition of this method. Aniline and 1,4-phenylenediamine are not detected under the condition of this method.
 - 2) The test method used was specified by client.
 - 3) The tested part of the sample was specified by client.
 - 4) The test conclusion was given based on the results of tested part.



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TEST RESULT 测试结果

XII. Production Check on SVHC – Cobalt dichloride & Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (SCCP)

XII. 产品中高度关注物质检查 – 二氯化钴和短链氯化石蜡

Test Item 1: Metal and non-metal part

No. / 编号	Substance name / 物质名称	CAS No. / CAS 编号	EC No. / EC 编号	Result / 结果, %	Detection Limit / 检测界限, %	Basis for identification as a SVHC / 被认为是高度关注物质的依据
				1		
1	Cobalt dichloride* / 二氯化钴*	7646-79-9	231-589-4	ND	0.01	Carcinogen, cat. 2
2	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (SCCP) / 短链氯化石蜡	85535-84-8	287-476-5	ND	0.01	PBT, vPvB

Method: Analysis is based on GC, LC, IC, ICP, with various detection techniques and UV. /

方法: 以各种不同的检测技术包括 GC,LC,IC,ICP,UV 分析.

Remark / 备注:

1. PBT = Persistent, bio accumulative and toxic as defined in Regulation (EC) No 1907/2006 / 根据(EC)1907/2006 号法规定义为持久性, 生物蓄积性和毒性.
2. vPvB = Very persistent and very bio accumulative as defined in Regulation (EC) No 1907/2006 / 根据(EC)1907/2006 号法规定义为高持久性, 高生物蓄积性.
3. ND = Not Detected / ND = 未检出
4. *Result is based on the heavy metal or inorganic element concentration. Due to the limit of the analytical technology available, any further investigation is not feasible. The client is strongly advised to review the chemical formulation to ascertain. / *所得结果是基于样品中重金属或无机元素含量计算而来. 由于目前技术条件的限制, 无法进行进一步的测试. 强烈建议客户先评估其化学式后再最后确定其结论.
5. The SVHC tested were specified by client. / 所测试的高度关注物质由客户指定.



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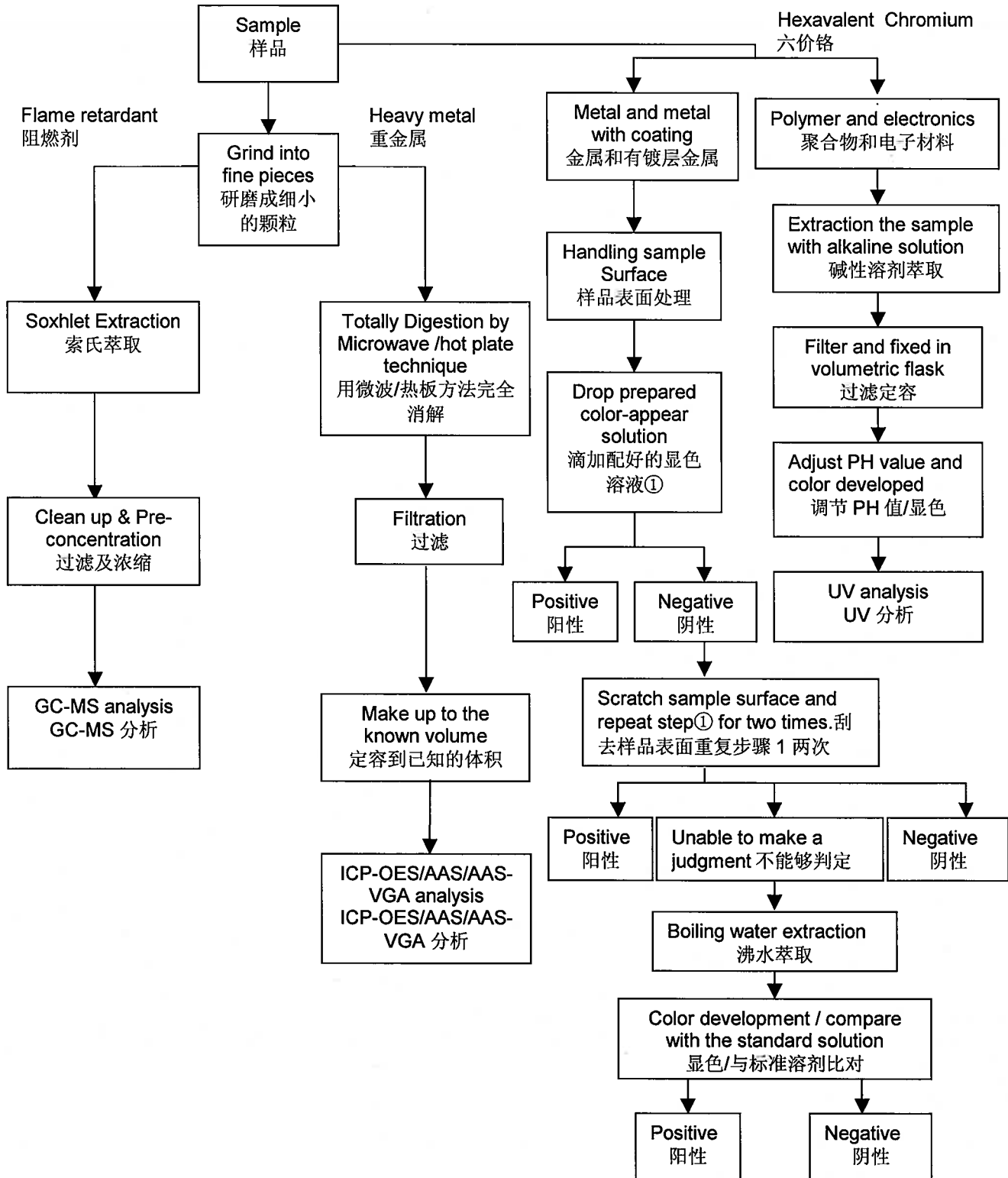
Note / 注意:

1. The limit of 0.1% (w/w) applies to an article. The results were calculated assuming as the submitted sample was an article. However, the results may not be applicable if the intended use of the sample is a substance or mixture. According to REACH, definition of an article, substance and mixture are: / 0.1%(w/w) 的限值适用于物品。以上结果是基于所提交样品为一个物品的假设计算得出的。然而, 该结果并不适用于单一物质或混合物的样品。根据 REACH, 对于物品, 物质和混合物有如下定义:
 - i. Article - An object during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition. / 物品 - 在生产过程中很大程度上的目的是给与该物品特定的形状, 表面或设计从而实现其特定功能, 而不是它的化学组成。
 - ii. Substance - A chemical element and its compound in the natural state or obtained by any manufacturing process / 物质 - 在自然界中存在或通过化学合成得到化学元素或其化合物
 - iii. Mixture (Previously known as "Preparation") - A mixture or solution composed of two or more substances / 混合物(以往称作“配置品”) - 由两个或以上物质组成的混合物或溶液。
2. In accordance of Article 7 of Regulation (EC) No. 1907/2006 (REACH regulation) – Registration and notification of substances in articles, any producer or importer of articles shall notify ECHA, if a substance meets in criteria in Article 57 and is identified in accordance with Article 59(1), if both (1) the substance is present in those articles in quantities totalling over 1 tonne per producer or importer per year & (2) the substance is present in those articles above a concentration of 0.1% weight by weight (w/w) are met. The information to be notified shall include (a) identity and contact details of the producer or importer, (b) the registration numbers, (c) the identity of the substance and (d) the classification of the substance, (e) a brief description of the use of the substance and (f) the tonnage range of the substance.
根据(EC)1907/2006 号法规(REACH 法规)第 7 条 – 在物品中的物质注册和通告义务: 如果该物质符合第 57 条的要求并符合 59(1)中的定义, 并且同时满足以下两个条件, (1)每年每一个进口商或者生产厂商进口或生产存在于这些物品中的该类物质总量超过一吨, (2)该类物质含量占整个物品超过 0.1%(w/w), 那么该物品的进口商或者生产商应该向欧洲化学品管理局通报。通报内容应该包括 (a)进口商和生产商的可靠联系信息, (b)注册号码, (c)该类物质的名称和(d)物质的分类, (e)对于该物质的用途的简单描述, (f)该物质的登记用量。
3. In accordance of Article 33 of Regulation (EC) No. 1907/2006 (REACH regulation) – Duty to communicate information on substances in articles, any supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in concentration above 0.1% weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance. On request by a consumer the relevant information shall be provided by any supplier of an article free of charge, within 45 days of receipt of the request.
根据(EC)1907/2006 号法规(REACH 法规)第 33 条 – 信息通告义务: 任何供应商提供的物品中含有的物质符合第 57 条的要求并符合 59(1)中的定义, 且其含量占整个物品超过 0.1%(w/w), 供应商应能够向物品的接受方提供足够的信息, 以便能够安全的使用该物品, 信息应该包括, 至少应提供该物质的名称。当物品供应商收到消费者请求后, 应在 45 天内向消费者免费提供相应的信息。

END

APPENDIX
附录

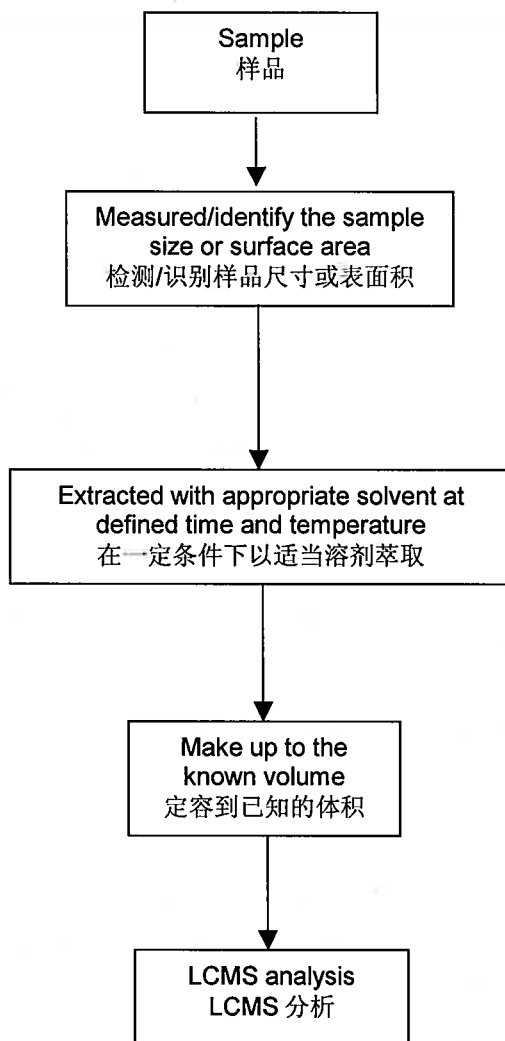
Test Procedures Flow Chart for the determination of RoHS (total heavy metals, Hexavalent Chromium and flame retardants)





APPENDIX
附录

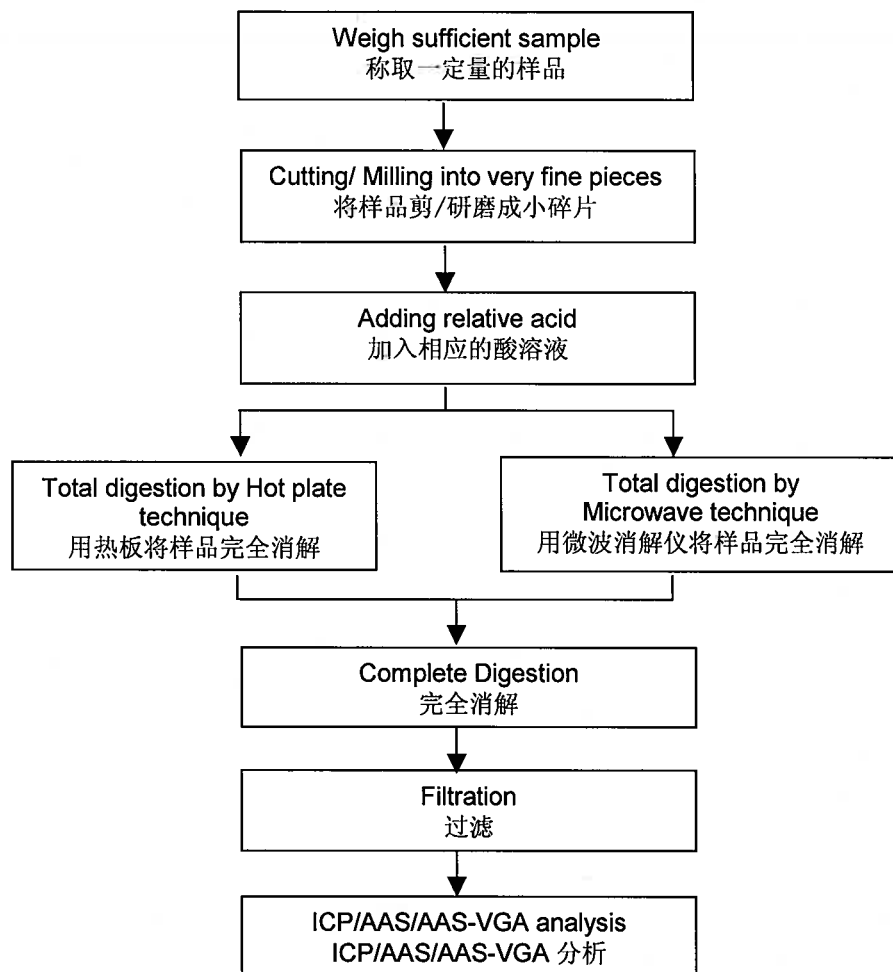
Test Procedures Flow Chart for the determination of PFOA and PFOS





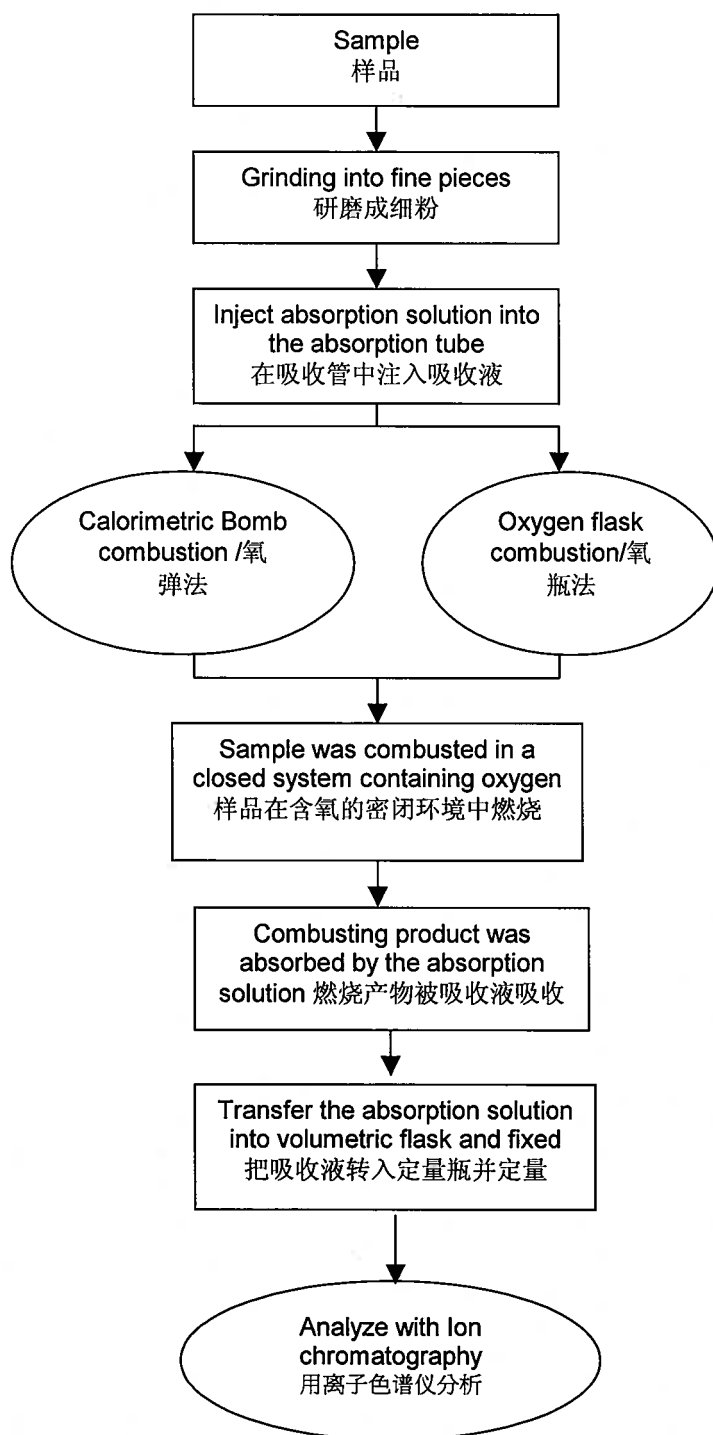
APPENDIX 附录

Flow chart of determination of heavy metals using different test methods



APPENDIX 附录

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





APPENDIX
附录

Test Procedures Flow Chart for the determination of Phthalates

