

No. SHAEC1628430704

日期: 2017年01月03日 第1页,共10页

金安国纪科技股份有限公司/上海国纪电子材料有限公司/国际层压板材有限公司/金安国纪科技(珠海)有限公司/金安国纪科技(杭州)有限公司

上海市松江区工业园区宝胜路33号

以下测试之样品是由申请者所提供及确认:FR-4.1无卤素环氧玻纤板

SGS工作编号: SP16-045774 - SH

样品接收日期: 2016年12月27日

测试周期: 2016年12月27日 - 2017年01月03日

测试要求: 根据客户要求测试

测试方法: 请参见下一页

测试结果: 请参见下一页

结论: 基于所送样品进行的测试,镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯

醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯 (DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基已基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的

测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值

要求。

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Marry Ma马广媛 批准签署人

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测试报告 日期: 2017年01月03日 第2页.共10页 No. SHAEC1628430704

测试结果:

测试样品描述:

样品编号 描述 SGS样品ID SN₁ SHA16-284307.002 黄色固体

备注:

(1) 1 mg/kg = 0.0001%

(2) MDL = 方法检测限

(3) ND = 未检出 (< MDL)

(4) "-" = 未规定

RoHS 指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: (1) 参考IEC 62321-5:2013,用ICP-OES测定镉的含量

(2) 参考IEC 62321-5:2013,用ICP-OES测定铅的含量

(3) 参考IEC 62321-4:2013,用ICP-OES测定汞的含量

(4) 参考IEC 62321:2008, 用紫外-可见分光光度计比色法测定六价铬的含量

(5) 参考IEC 62321-6:2015,用GC-MS测定PBBs(多溴联苯)和PBDEs(多溴二苯醚)的含量

(6) 参考IEC 62321-8 Ed.1.0 (111/321/CD),用GC-MS测定邻苯二甲酸酯的含量

<u>测试项目</u>	<u>限值</u>	<u>单位</u>	<u>MDL</u>	<u>002</u>
镉(Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	10
汞(Hg)	1000	mg/kg	2	ND
六价铬(CrVI)	1000	mg/kg	2	ND
多溴联苯之和(PBBs)	1000	mg/kg	-	ND
一溴联苯	-	mg/kg	5	ND
二溴联苯	-	mg/kg	5	ND
三溴联苯	-	mg/kg	5	ND
四溴联苯	-	mg/kg	5	ND
五溴联苯	-	mg/kg	5	ND
六溴联苯	-	mg/kg	5	ND
七溴联苯	-	mg/kg	5	ND
八溴联苯	-	mg/kg	5	ND
九溴联苯	-	mg/kg	5	ND
十溴联苯	-	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1000	mg/kg	-	ND
一溴二苯醚	-	mg/kg	5	ND



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测试报告	No. SHAEC1628430704	日期: 2017年01月03日	第3页,共10页

测试项目	限值	<u>单位</u>	<u>MDL</u>	<u>002</u>
二溴二苯醚	-	mg/kg	5	ND
三溴二苯醚	-	mg/kg	5	ND
四溴二苯醚	-	mg/kg	5	ND
五溴二苯醚	-	mg/kg	5	ND
六溴二苯醚	-	mg/kg	5	ND
七溴二苯醚	-	mg/kg	5	ND
八溴二苯醚	-	mg/kg	5	ND
九溴二苯醚	-	mg/kg	5	ND
十溴二苯醚	-	mg/kg	5	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯(BBP)	1000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯(DEHP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯(DIBP)	1000	mg/kg	50	ND

备注:

- (1) 最大允许极限值引用自RoHS指令(EU) 2015/863。
- (2) 2015年6月4号发表在欧盟官方杂志(官方公报)上的RoHS指令(EU) 2015/863 附录II限值中还包括邻苯 二甲酸酯BBP,DBP,DEHP和DIBP。新的指令限制了电子电器产品的每一个均一材质中邻苯二甲酸酯含 量不得超过0.1%。
- (3) 2021年7月22号开始, DEHP, BBP, DBP 和 DIBP的限制适用于医疗器械,包括体外医疗器械,监控仪 表,包括工业监测和控制仪器。
- (4) DEHP, BBP, DBP 和 DIBP的限制不适用于2019年7月22日前投放市场的电缆及电子电气产品中用于维 修、重复利用、功能更新及容量提升的备用配件以及2021年7月22日前投放市场的医疗器械,包括体外医 疗器械, 监控仪表, 包括工业监测和控制仪器。
- (5) DEHP、BBP 和 DBP的限制不适用于玩具产品,因为No.1907/2006附录XVII第51条已对玩具产品中 的DEHP、BBP 和 DBP含量进行了限制。

六溴环十二烷(HBCDD)

测试方法: 参照US EPA 3550C: 2007 方法测定, 采用GC-MS进行分析.

测试项目	CAS NO.	<u>单位</u>	<u>MDL</u>	<u>002</u>
六溴环十二烷 (HBCDD)	25637-99-4,	mg/kg	10	ND
	3194- 55-6			

石棉



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测试报告 No. SHAEC1628430704 日期: 2017年01月03日 第4页.共10页

测试方法: 参照NIOSH 9002:1994, 用偏光显微镜定性测定石棉.

<u>测试项目</u> 阳起石	<u>CAS NO.</u> 77536-66-4	<u>单位</u> %	<u>MDL</u> 0.1	<i>002</i> 阴性
铁石棉	12172-73-5	%	0.1	阴性
直闪石	77536-67-5	%	0.1	阴性
温石棉	12001-29-5 132207-32-0	%	0.1	阴性
青石棉	12001-28-4	%	0.1	阴性
透闪石	77536-68-6	%	0.1	阴性

备注:

(1) 阴性=未检出石棉,阳性=检出石棉

全氟辛烷磺酸 (PFOS)和全氟辛酸(PFOA)

测试方法: 参照US EPA 3550C: 2007. 采用HPLC-MS测试.

测试项目	<u>限值</u>	<u>单位</u>	<u>MDL</u>	002
全氟辛烷磺酸(PFOS)及衍生物^	1000	mg/kg	10	ND
全氟辛酸 (PFOA)	-	mg/kg	10	ND

备注:

- (1) 最大允许限制引用自(EC) No. 850/2004 的修订指令欧盟决议(EU) No. 757/2010.
- (2) ^= PFOS包含全氟辛烷磺酸(PFOS), 全氟辛基磺酰胺(PFOSA), 2-(N-乙基全氟辛基磺酰胺)乙 醇(EtFOSE), N-甲基全氟辛烷磺酰胺(MeFOSA), N-乙基全氟辛烷磺酰胺(EtFOSA)和2-(N-甲基全氟辛基磺 酰胺)乙醇(MeFOSE)。

邻苯二甲酸盐(或酯)

测试方法: 参照EN 14372: 2004的方法测定, 采用GC-MS进行分析.

测试项目	CAS NO.	<u>单位</u>	<u>MDL</u>	002
邻苯二甲酸二异壬酯 (DINP)	28553-12-0/	%	0.01	ND
	68515-48-0			
邻苯二甲酸二正辛酯 (DNOP)	117-84-0	%	0.003	ND



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测试报告 No. SHAEC1628430704 日期: 2017年01月03日	第5页,共10页

测试项目	CAS NO.	<u>单位</u>	<u>MDL</u>	002
邻苯二甲酸二异癸酯 (DIDP)	26761-40-0/	%	0.01	ND
	68515-49-1			
邻苯二甲酸二正已酯(DnHP)	84-75-3	%	0.003	ND
邻苯二甲酸二异丁酯(DIBP)	84-69-5	%	0.003	ND
邻苯二甲酸二丁酯(DBP)	84-74-2	%	0.003	ND
邻苯二甲酸丁苄酯 (BBP)	85-68-7	%	0.003	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	117-81-7	%	0.003	ND

备注:

- (1) DBP, BBP, DEHP 参考信息: 1907/2006/EC Reach 附录XVII的修正指令——552/2009/EC 第51条 (前身 为2005/84/EC) 的要求:
- i) 不允许DBP, BBP, DEHP质量浓度高于0.1%的可塑性物料用于玩具和儿童护理品
- ii) 当玩具和儿童护理品中的可塑性物料含DBP, BBP, DEHP质量浓度高于0.1%时,不得投放市场 详细信息请参见Regulation (EC) No 552/2009

DINP, DNOP, DIDP参考信息: 1907/2006/EC Reach 附录XVII的修正指令——552/2009/EC 第52条 (前身 为2005/84/EC) 的要求:

- i) 不允许DINP, DNOP, DIDP质量浓度高于0.1%的可塑性物料用于可放入儿童口中的玩具和儿童护理品 ii) 当可放入儿童口中的玩具和儿童护理品中的可塑性物料含DINP, DNOP, DIDP质量浓度高于0.1%时, 不得 投放市场。
- 详细信息请参见Regulation (EC) No 552/2009



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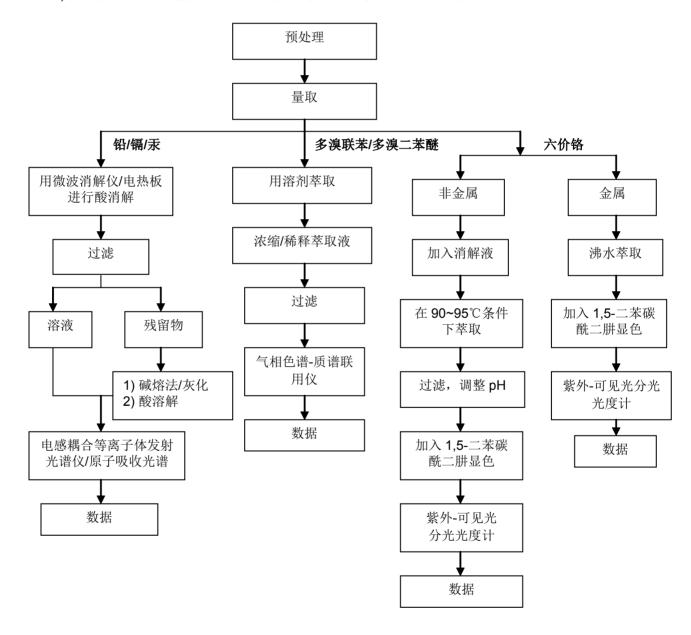
No. SHAEC1628430704

日期: 2017年01月03日 第6页.共10页

附件

RoHS 测试流程图

- 1) 分析人员: 金叶/徐刚/李振/宋柯静
- 2) 项目负责人: 施青/黄婷/徐亮/王晓艳
- 3) 样品按照下述流程被完全消解(六价铬和多溴联苯/多溴二苯醚测试除外)。





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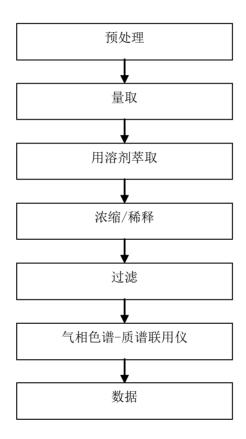
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附件

Phthalates 测试流程图

1) 分析人员: 高仰景 2) 项目负责人: 黄婷





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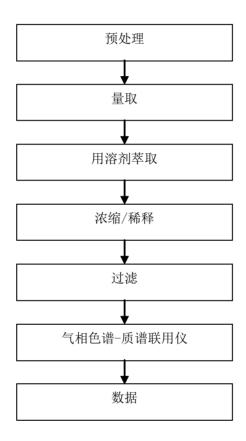
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附件

HBCDD 测试流程图

1) 分析人员: 徐刚 2) 项目负责人: 黄婷





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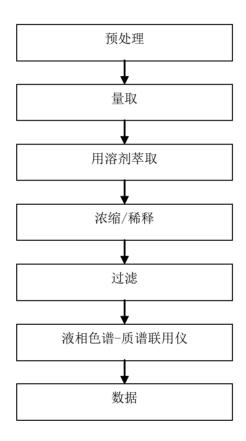
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日期: 2017年01月03日 第9页.共10页

附件

PFOS/PFOA 测试流程图

1) 分析人员: 杨占君 2) 项目负责人: 马永存





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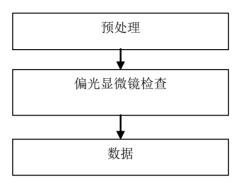
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附件

Asbestos 测试流程图

1) 分析人员: 黄慧丽 2) 项目负责人: 余锦晖



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