

Stanyl® 46HF4530 (Provisional)

Property Data

PA46-GF30

30% Glass Reinforced, Heat Stabilized, High Flow for E&E applications

Properties	Typical Data	Unit	Test Method
RHEOLOGICAL PROPERTIES	dry / cond		
Molding shrinkage (parallel)	0.5/*	%	ISO 294-4
Molding shrinkage (normal)	1.3/*	%	ISO 294-4
MECHANICAL PROPERTIES	dry / cond		
Tensile modulus	10000 / 6000	MPa	ISO 527-1/-2
Tensile modulus (120°C)	5500	MPa	ISO 527-1/-2
Tensile modulus (160°C)	5000	MPa	ISO 527-1/-2
Stress at break	210 / 115	MPa	ISO 527-1/-2
Stress at break (120°C)	125	MPa	ISO 527-1/-2
Stress at break (160°C)	110	MPa	ISO 527-1/-2
Strain at break	3/6	%	ISO 527-1/-2
Strain at break (120°C)	5.5	%	ISO 527-1/-2
Strain at break (160°C)	5.5	%	ISO 527-1/-2
Flexural modulus	9000 / 5500	MPa	ISO 178
Charpy impact strength (+23°C)	60 / 90	kJ/m²	ISO 179/1eU
Charpy impact strength (-30°C)	60 / 60	kJ/m²	ISO 179/1eU
Charpy notched impact strength (+23°C)	13 / 17	kJ/m²	ISO 179/1eA
Charpy notched impact strength (-30°C)	12 / 12	kJ/m²	ISO 179/1eA
THERMAL PROPERTIES	dry / cond		
Melting temperature (10°C/min)	295/*	°C	ISO 11357-1/-3
Temp. of deflection under load (1.80 MPa)	290 / *	°C	ISO 75-1/-2
Coeff. of linear therm. expansion (parallel)	0.25 / *	E-4/°C	ISO 11359-1/-2
Coeff. of linear therm. expansion (normal)	0.6/*	E-4/°C	ISO 11359-1/-2
Burning Behav. at 1.5 mm nom. thickn.	HB/*	class	IEC 60695-11-10
Thickness tested	1.5 / *	mm	IEC 60695-11-10
Burning Behav. at thickness h	HB/*	class	IEC 60695-11-10
Thickness tested	0.75/*	mm	IEC 60695-11-10
ELECTRICAL PROPERTIES	dry / cond		
Volume resistivity	1E13 / 1E9	Ohm*m	IEC 60093
Electric strength	30 / 25	kV/mm	IEC 60243-1
OTHER PROPERTIES	dry / cond		
Humidity absorption	2.6 / *	%	Sim. to ISO 62
Density	1410/-	kg/m³	ISO 1183

06.04.2007

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DATE:

MAR: 04,2010

Customer: 川點投資有限公司

Commodity:

C 2680 R BRASS STRIP (H)

1 150 9002:4M8Y035-00 台正字第 3544 號

Applied Standard: CMS 4383 Brass Sheets Pia es and Strips

					Chemical	Analysis T	est		
Work No.	Size Thickness (mm)		Length (mm)	±1 Cu(F)	Fc(%)	Pb(%)	Zn(%)		
	St	andard		64.00 - 68.00	max. 0.050	max. 0.014	REN.		P.O. NUMBER
91A447A	0.250	39.000		65.806	0.007	0.004	REM.		L.O. HUELDER
91A447A	0.259	72.000		65.806	0.007	0.004	REM.		
91A447B	0.250	39.000		65.806	0.007	0.004	REM.	,	
91A447B	0.250	72-000		65.806	0.007	0.004	RE4.		

	Size	of Proc	luct	Dimension Test		Tension Test				Electric
Work No.	Thickness (mm)	Width (mm)	Length (mm)	Thekness (nm)	Width (mm)	Tensile Strength (kgf/mm²)		Hardness Test HV	Grain Size (mm)	Conductivity (%)
1	St	andard			(-) 0.06 - (+) 0.00	42 - 55		135 - 145		
91A447A	0.250	39.000		GOLD.	G000.	48.15	22.46	144.0 - 145.0		25.5
91A447A	0.250	72.000		GOLD.	GOOD.	48.15	22.46	144.0 - 145.0		25.5
91A447B	0.250	39.000		GOT D.	GOOD.	48.15	22.46	144.0 - 145.0		25.5
91A447B	0.250	72.000		GO(D.	600D.	48.15	22.46	144.0 - 145.0		25_5

MINCHALI METAL INDUSTRY CO., LTD. 11, Pei Yuan Road, Chung Li City, Taiwan, R. O. C.

Tel: (03)4526141-5 (03)4526017-9

QC Supervisor

即建益

A: 20202

2010 16:17

MAR.

10, 693

@MINCHALI

REPORT OF MATERIAL TEST

DATE: JLY.21,2009

Customer國際精幣股份有限公司

Commodity: C 5191 R PHOSPHOR BRONZE STRIP (H)

Applied Standard: CNS 9503 Phosphor Bronze Sheets, Plates and Strips

	₽ ISO	9002:	4M8Y0	35-00	
1	台下	字第	35/15	號	

	Chemical Analysis Test									
	Size	of Prod	luct	75.484					1	
Work No.	Thickness (mm)	Width (mm)	Length (mm)	P(%)	Sn(%)	Cu+Sn+P(%)				
dulle .	St	andard		0.030 - 0.350	5.50 - 7.00	min. 99.50				
87C014A	0.200	624.000		0.116	5.830	99.955	323			
87C014B	0.200	624.000		0.116	5.830	99.955	348			
87C089B	0.250	622.000		0.144	6.064	99.953	2650			
87C088A	0.250	623.000	2 1	0.137	6.054	99.960	798			

Ţ.				Mechai	nical & Phys	ical Test				
	Size of Product			Dimension Test		Tension Test		Hardness Test	Grain Size	Electric
Work No.	Thickness (mm)	Width (mm)	Length (mm)	Thickness (mm)	Width (mm)	Tensile Strength (kgf/mm²)	Elongation (%)	HV	(mm)	Conductivity (%)
- <u>2</u> 4	Standard		(-) 0.010 - (+) 0.000	(-) 0.10 - (+) 0.00	60 - 70	60 - 70 min. 8		_	_	
87C014A	0.200	624.000		0.200	GOOD.	60.92	23.34	186.0 - 187.0	• <u>-</u>	15.2
87C014B	0.200	624.000		0.200	GOOD.	60.92	23.34	186.0 - 187.0	teri-	15.2
87C089B	0.250	622.000		0.248	GOOD.	62.58	22.92	194.0 - 195.0	_	14.2
87C088A	0.250	623.000		0.246	GOOD.	62.60	22.60	194.0 - 195.0	_	14.2

MINCHALI METAL INDUSTRY CO., LTD.

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QC Supervisor

鄭建益

A920303



No. NGBML1201536501

Date: 06 Sep 2012

Page 1 of 5

YUEQING HUAXIN ELECTRONICS CO.,LTD.

(EAST TOWN INDUSTRIAL DISTRICT) 917NUMBER, HAPPY EAST ROAD HONGQIAO , YUEQING, ZHEJIANG

The following sample(s) was/were submitted and identified on behalf of the clients as: NYLON

SGS Job No.:

NBMLC120800200 - NB

Material and Mark:

PA46

Buyer:

WANG JIN LING

Manufacturer:

WANG JIN LING

Date of Sample Received:

31 Aug 2012

Testing Period:

31 Aug 2012 - 06 Sep 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

XiaoLingYan, Iris Approved Signatory

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No. NGBML1201536501

Date: 06 Sep 2012

Page 2 of 5

Test Results:

Test Part Description:

Specimen No.

SGS Sample ID

Description

1

NGB12-015365.001

BLACK PLASTIC PELLET

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)		<u>Limit</u>	<u>Unit</u>	MDL	<u>001</u>
Cadmium (Cd)		100	mg/kg	2	ND
Lead (Pb)		1000	mg/kg	2	11
Mercury (Hg)		1000	mg/kg	2	ND
Hexavalent Chromium (CrVI)		1000	mg/kg	2	ND
Sum of PBBs		1000	mg/kg	-	ND
Monobromobiphenyl		-	mg/kg	5	ND
Dibromobiphenyl		-	mg/kg	5	ND
Tribromobiphenyl		 -	mg/kg	5	ND
Tetrabromobiphenyl	,	_	mg/kg	5	ND
Pentabromobiphenyl		• -	mg/kg	. 5	ND
Hexabromobiphenyl		-	mg/kg	5	ND
Heptabromobiphenyl		 	mg/kg	5	ND
Octabromobiphenyl			mg/kg	5	ND
Nonabromobiphenyl		-	mg/kg	5	ND
Decabromobiphenyl		-	mg/kg	-5	ND
Sum of PBDEs		1000	mg/kg	•	ND
Monobromodiphenyl ether		. -	mg/kg	5	ND

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Test Report	No. NGBML12015365	No. NGBML1201536501		Sep 2012	Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>001</u>	
Dibromodiphenyl ether	-	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

(1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II

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No. NGBML1201536501

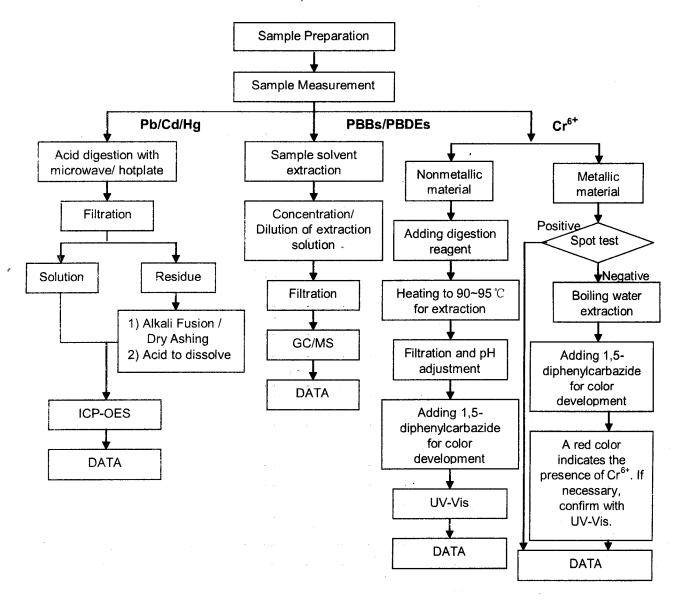
Date: 06 Sep 2012

Page 4 of 5

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: John Zhu/ Kell Li / Pearson Zhou
- 2) Name of the person in charge of testing: Sharon Liu
- 3) These samples were dissolved totally by pre-conditioning method according to below flo w chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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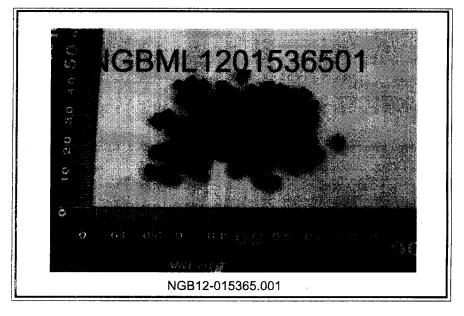


No. NGBML1201536501

Date: 06 Sep 2012

Page 5 of 5

Sample photo:



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It is a stated the realities shown in this test report refer only to the sample(e) tested.

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HL: (86-574)87768122 e sgs.china@sgs.com



Test Report No. CANEC1211542206 Date: 29 Aug 2012 Page 1 of 4

FOSHAN TIANQI COPPER INDUSTRY CO.,LTD.

HING KEI BLOCK GUIHE ROAD DALI TOWN NANHAI FOSHAN GUANGDONG CHINA

This report is to supersede test report CANEC1210897806

The following sample(s) was/were submitted and identified on behalf of the clients as: BRASS STRIP(C2680)

SGS Job No.: CP12-041022 - GZ

Tested Sample Info. : C2680

Date of Sample Received: 11 Aug 2012

Testing Period: 11 Aug 2012 - 17 Aug 2012

Test Requested: Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

Kenny Wang Approved Signatory



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Test Report No. CANEC1211542206 Date: 29 Aug 2012 Page 2 of 4

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 CAN12-115422.004 Brassy metal sheet

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

Elementary Analysis

Test Method: With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.

Test Item(s)	<u>Unit</u>	<u>MDL</u>	<u>004</u>
Cadmium (Cd)	mg/kg	2	ND
Lead (Pb)	mg/kg	2	11
Mercury (Hg)	mg/kg	2	ND
Hexavalent Chromium (CrVI)	-	\Diamond	Negative

Notes:

(1) Spot-test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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No. CANEC1211542206

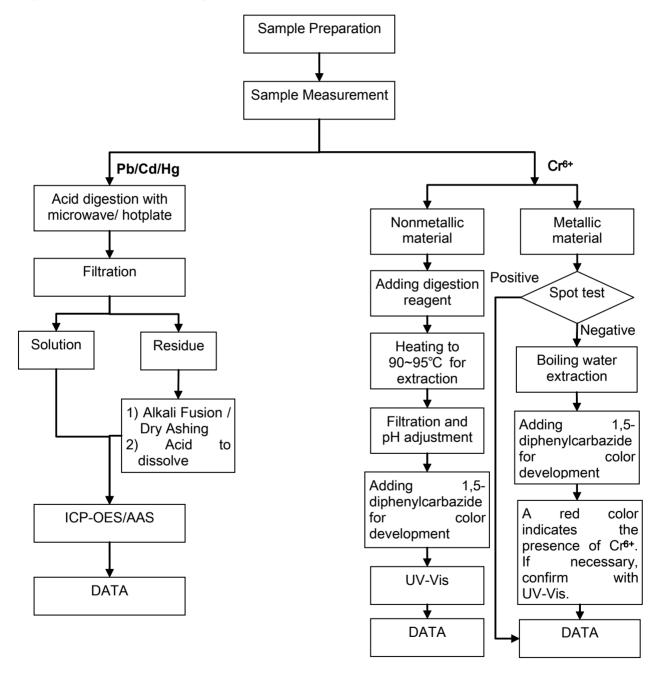
Date: 29 Aug 2012

Page 3 of 4

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Bella Wang
- 2) Name of the person in charge of testing: Adams Yu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr6+ test method excluded).



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No. CANEC1211542206

Date: 29 Aug 2012

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Sample photo:



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Member of the SGS Group (SGS SA)



Test Report No. CANEC1211542204 Date: 29 Aug 2012 Page 1 of 4

FOSHAN TIANQI COPPER INDUSTRY CO.,LTD.

HING KEI BLOCK GUIHE ROAD DALI TOWN NANHAI FOSHAN GUANGDONG CHINA

This report is to supersede test report CANEC1210897804

The following sample(s) was/were submitted and identified on behalf of the clients as: PHOSPHOR BRONZE STRIP(C5191);

SGS Job No.: CP12-041022 - GZ

Tested Sample Info. : C5191

Date of Sample Received: 11 Aug 2012

Testing Period: 11 Aug 2012 - 17 Aug 2012

Test Requested: Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

Kenny Wang

Approved Signatory



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No. CANEC1211542204

Date: 29 Aug 2012

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Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

CAN12-115422.003 Copper-colored metal sheet

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

Elementary Analysis

Test Method: With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.

Test Item(s)	<u>Unit</u>	<u>MDL</u>	<u>003</u>
Cadmium (Cd)	mg/kg	2	ND
Lead (Pb)	mg/kg	2	12
Mercury (Hg)	mg/kg	2	ND
Hexavalent Chromium (CrVI)	-	\Diamond	Negative

Notes:

(1) Spot-test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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No. CANEC1211542204

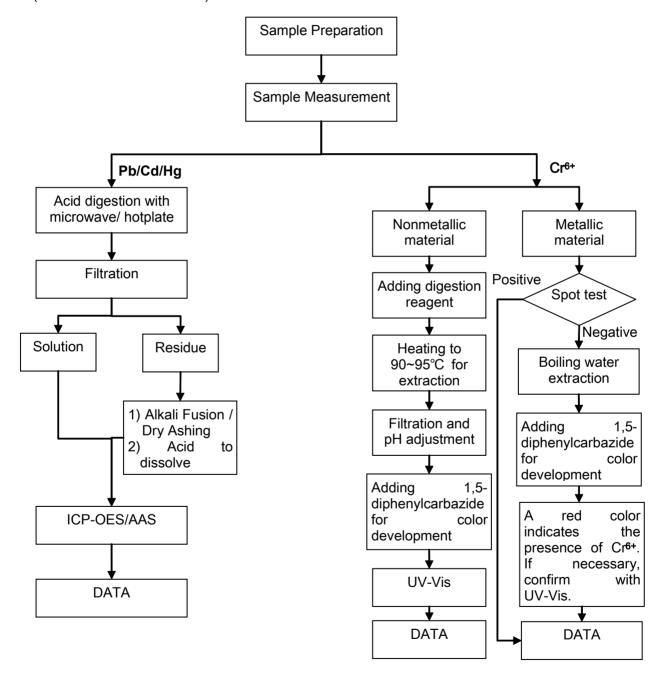
Date: 29 Aug 2012

Page 3 of 4

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Bella Wang
- 2) Name of the person in charge of testing: Adams Yu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr6+ test method excluded).



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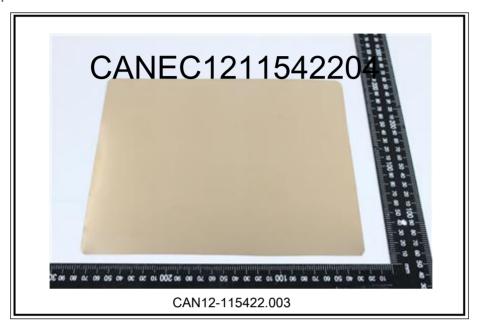


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Sample photo:



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No. NGBEC1201943402

日期: 2012年11月06日 第1页,共4页

余姚市楷瑞电子有限公司 中国浙江省余姚市泗门镇相公潭村

以下测试之样品是由申请者所提供及确认:镀金镀锡铜端子

SGS工作编号: NP12-001623 - NB

样品接收日期: 2012年11月02日

测试周期: 2012年11月02日 - 2012年11月06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

通标标准技术服务有限公司 授权签名

Iris Xiao肖玲艳 批准签署人

本报告是编号为NGBEC1201943401报告的中文版本

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测试报告 No. NGBEC1201943402 日期: 2012年11月06日 第2页,共4页

测试结果:

测试样品描述:

样品编号 SGS样品ID 描述

银色铜色金属(混合) 1 NGB12-019434.001

备注:

(1) 1 mg/kg = 1 ppm = 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

测试方法: 参考IEC 62321:2008:

(1) 用ICP-OES测定镉的含量.

(2) 用ICP-OES测定铅的含量.

(3) 用ICP-OES测定汞的含量.

(4) 用点测试法/紫外-可见分光光度计比色法测定六价铬的含量.

测试项目	限值	<u>单位</u>	<u>MDL</u>	<u>001</u>
镉 (Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	23
汞 (Hg)	1000	mg/kg	2	ND
六价铬(CrVI)	-	-	\Diamond	阴性

备注:

- (1) 最大允许极限值引用自指令2011/65/EU 附录II.
- (2) ◊点测试法:

阴性= 未检测到六价铬,阳性 = 检测到六价铬;

(当点测试结果为阴性或无法确定时,将采用沸水萃取法作进一步的结果验证.)

◇沸水萃取法:

阴性= 未检测到六价铬

阳性= 检测到六价铬; 表明50 cm²表面积的被测试样品的沸水萃取液中六价铬的浓度等于或大于0.02 mg/kg 针对金属表面的防腐涂层:由于未获知样品的存储条件和生产日期,样品的六价铬测试结果仅代表测试时样品

(3) 样品基于申请人要求为混合测试。报告中的混合测试结果不代表其中个别单一材质的含量,该测试数据 仅供参考。

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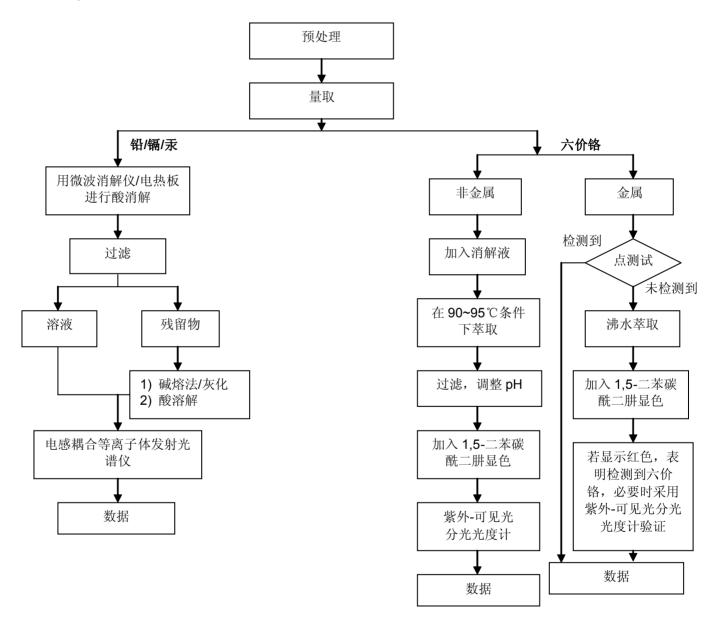
日期: 2012年11月06日

第3页,共4页

附件

RoHS 测试流程图

- 1) 分析人员: 朱再峰/朱淑娴
- 2) 项目负责人: 李科建
- 3) 样品按照下述流程被完全消解(六价铬测试除外)



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日期: 2012年11月06日

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No. NGBEC1202032302

日期: 2012年11月19日 第1页,共3页

余姚市五星金属电镀有限公司 中国浙江省余姚市小曹娥镇滨海村

以下测试之样品是由申请者所提供及确认:镀镍铜带

SGS工作编号: NP12-001706 - NB

样品接收日期: 2012年11月15日

测试周期: 2012年11月15日 - 2012年11月19日

测试要求: 根据客户要求测试

测试方法: 请参见下一页 演参见下一页 请参见下一页

结论: 基于所送样品进行的测试,镉、铅、汞、六价铬的测试结果符合欧盟RoHS指

令2002/95/EC的重订指令2011/65/EU附录II的限值要求。

通标标准技术服务有限公司 授权签名

Iris Xiao肖玲艳

批准签署人

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测试报告 No. NGBEC1202032302

日期: 2012年11月19日 第2页,共3页

测试结果:

测试样品描述:

样品编号SGS样品ID描述1NGB12-020323.001银色金属

备注:

(1) 1 mg/kg = 1 ppm = 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

测试方法: 参考IEC 62321:2008:

(1) 用ICP-OES测定镉的含量.(2) 用ICP-OES测定铅的含量.(3) 用ICP-OES测定汞的含量.

(4) 用点测试法/紫外-可见分光光度计比色法测定六价铬的含量.

<u>测试项目</u>	<u>限值</u>	<u>单位</u>	<u>MDL</u>	<u>001</u>
镉 (Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	ND
汞 (Hg)	1000	mg/kg	2	ND
六价铬(CrVI)	-	-	\Diamond	阴性

备注:

- (1) 最大允许极限值引用自指令2011/65/EU 附录II.
- (2) ◊点测试法:

阴性= 未检测到六价铬,阳性 = 检测到六价铬;

(当点测试结果为阴性或无法确定时,将采用沸水萃取法作进一步的结果验证.)

◇沸水萃取法:

阴性= 未检测到六价铬

阳性=检测到六价铬;表明50 cm²表面积的被测试样品的沸水萃取液中六价铬的浓度等于或大于0.02 mg/kg针对金属表面的防腐涂层:由于未获知样品的存储条件和生产日期,样品的六价铬测试结果仅代表测试时样品的状态

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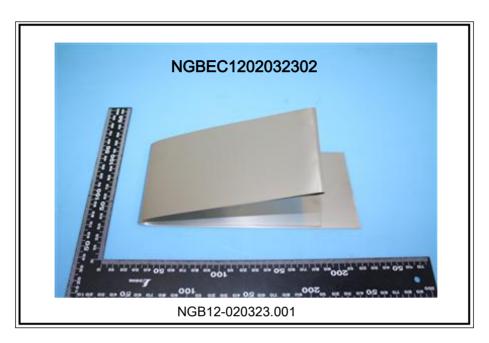


No. NGBEC1202032302

日期: 2012年11月19日

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