

浙江创都电子科技有限公司

ZHE JIANG CHUANG DU ELECTRONICS CO.,LTD

APPROVAL SHEET

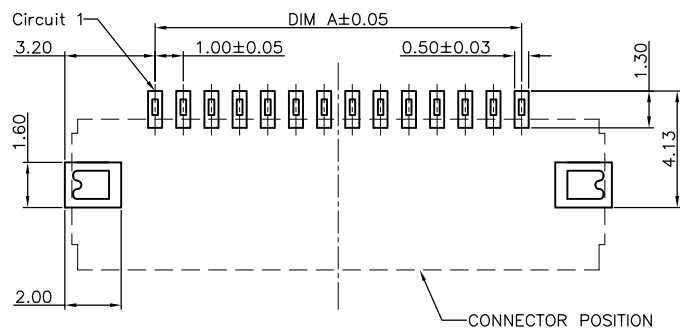
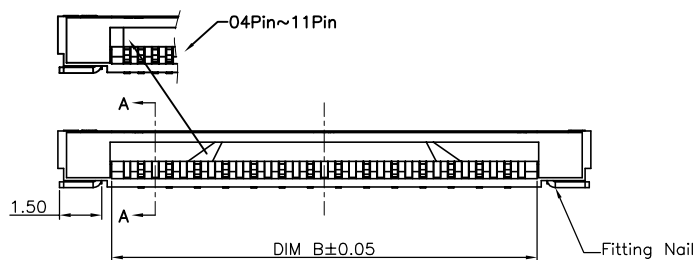
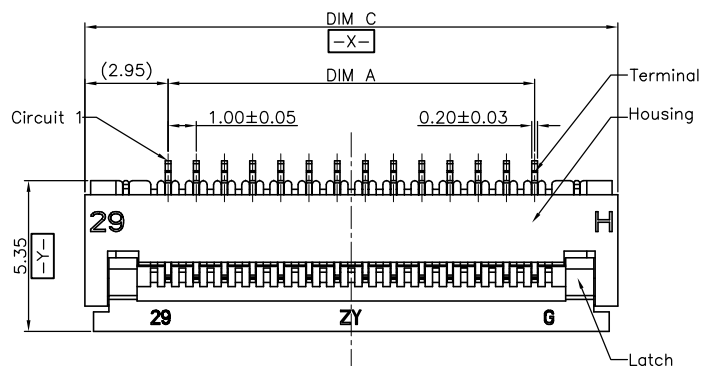
CUSTOMER: _____

CUSTOMER P/N: _____
(小批可用管装) (批量推荐卷装)

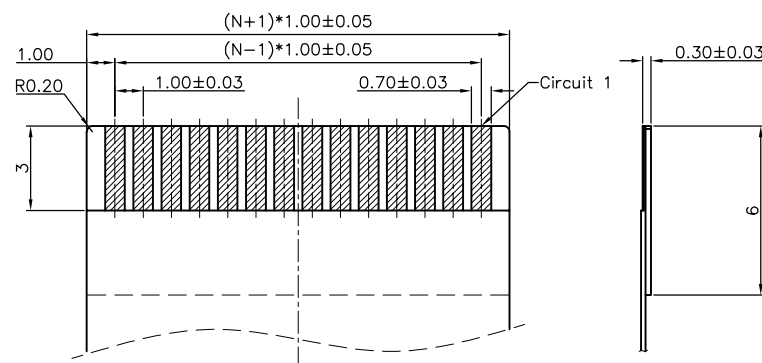
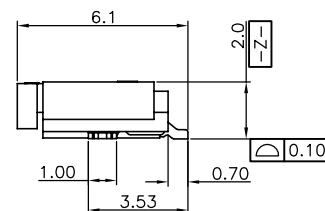
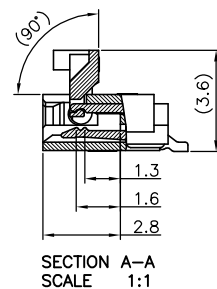
PART NAME: 1.0mmPitch H=2.0mm SMT 掀盖式

PART NO. : AFA01-S12FCA-00-H2.0

MANUFACTURE SIGNATURE			CUSTOMER SIGNATURE
SALES REP.	R&D DEPT.	QA DEPT	
DAET:	DAET:	DAET:	DAET:



RECOMMENDED P.C.B PATTERN LAYOUT



RECOMMENDED FPC/FFC DIMENSION

Note:

1. Material:

- 1.1 Housing: thermoplastic high temp.UL94V-0; Color: natural.
- 1.2 Latch: thermoplastic high temp.UL94V-0; Color: black.
- 1.3 Terminal: copper alloy.
- 1.4 Fitting Nail: copper alloy.

2. Finish:

- 2.1 Terminal: Underplating: Au/matt Tin overall.
- 2.2 Fitting Nail: Underplating: matt Tin overall.

3. Product must comply HF RoHS specification.

4. Product No:

AFA01-S
CKTS **
CONTACTS TYPE H
F:Lower
H:Double Lower
PLATING
1:Gold flash 1u"
2:Gold flash 2u"
3:Gold flash 3u"
B:Bright-Tin 90-120u"
C:Matt-Tin 90-120u"

REMARKS
HF:Halogen free

PACKING
A:Tape&Reel
C:Tube

CKTS	DIM A	DIM B	DIM C
4	3.00	5.10	8.90
5	4.00	6.10	9.90
6	5.00	7.10	10.90
7	6.00	8.10	11.90
8	7.00	9.10	12.90
9	8.00	10.10	13.90
10	9.00	11.10	14.90
11	10.00	12.10	15.90
12	11.00	13.10	16.90
13	12.00	14.10	17.90
14	13.00	15.10	18.90
15	14.00	16.10	19.90
16	15.00	17.10	20.90
17	16.00	18.10	21.90
18	17.00	19.10	22.90
19	18.00	20.10	23.90
20	19.00	21.10	24.90
21	20.00	22.10	25.90
22	21.00	23.10	26.90
23	22.00	24.10	27.90
24	23.00	25.10	28.90
25	24.00	26.10	29.90
26	25.00	27.10	30.90
27	26.00	28.10	31.90
28	27.00	29.10	32.90
29	28.00	30.10	33.90
30	29.00	31.10	34.90

CUSTOMER DRAWING

Tolerance Unspecified
(未注公差)
0.0 ±0.15 0° ±5°
0.00 ±0.10 0°0 ±3°
0.000 ±0.05 0°00 ±1°

Size(图幅):
A4
Unit(单位):
MM
Scale(比例):
1:1

Project View
(投影视角)

Page(页数):
1 OF 1

Rev(版本):
A

浙江创都电子科技有限公司

ZHE JIANG CHUANG DU ELECTRONICS CO.,LTD

Product Name(产品名称):
1.0Pitch H=2.0 FPC Easy-on R/A D/C Type1 SMT CONN

Product No(产品料号):
AFA01-S12FCA-00-H2.0

Designer(设计):
Checked(审核):
Approved(核准):

Rev	Change Description	Date	Revisor
版本	变更内容	日期	制/修订人

浙江创都电子科技有限公司

ZHE JIANG CHUANG DU ELECTRONICS CO.,LTD

REV. A

产 品 规 格 书 PRODUCT SPECIFICATION

【1】适用范围 SCOPE

本规格书适用于 1.0mm Pitch H=2.0 FPC 掀盖卧式 SMT 型连接器系列。

This specification covers the 1.0mm Pitch H=2.0 FPC Easy-on R/A SMT type connectors series.

【2】外观尺寸 CONNECTOR DIMENSIONS

请参照图面

See attached drawings.

【3】材质 MATERIAL

绝缘胶体 Housing: LCP

颜色 Color:白色 White

耐燃等级 (UL94V-0)Flammability Rating (UL94V-0).

后盖 Actuator: LCP

颜色 Color:黑色 Black

耐燃等级 (UL94V-0)Flammability Rating (UL94V-0).

端子 Terminal: 磷青铜 Phosphor Bronze.

焊片 Fitting Nail:磷青铜 Phosphor Bronze.

【4】建议 P. C. B LAYOUT 图 ACCOMMODATED P. C. B LAYOUT

请参照图面

See attached drawings.

【5】等级 RATING

项 目 ITEM	规 格 SPECIFICATIONS
最大容许电压 Operating Voltage(Max.)	50V AC
最大容许电流 Current Rating(Max.)	0.5A DC
使用温度范围 Operating Temperature range	-55℃ ~ +85℃
使用湿度范围 Operating humidity range	相对湿度90%以下 Relative humidity 90% max.
保存温度范围 Storage temperature range	-10℃ ~ +50℃
保存湿度范围 Storage humidity range	相对湿度90%以下 Relative humidity 90% max.

*:包含电流通过所产生的上升温度 Including terminal temperature rise.

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ZHE JIANG CHUANG DU ELECTRONICS CO.,LTD

REV. A

【6】性能 PERFORMANCE

6.1 电气特性 ELECTRICAL PERFORMANCE

项目 ITEM	测试条件 TEST CONDITION	规格 REQUIRMENT
接触阻抗 Contact Resistance	将样品与适合之FPC连接, 测试电压20mV, 限电流10mA下进行阻抗测试。(EIA-364-23) Mate applicable FPC and measure by dry circuit, 20mV Max, 10mA. (EIA-364-23)	40 mΩ最大. 40 mΩ Max.
绝缘阻抗 Insulation Resistance	将样品与适合之FPC连接, 提供相邻端子间测试电压500V DC进行绝缘阻抗测试(EIA-364-21) Mate applicable FPC and apply 500V DC between adjacent terminal or ground. (EIA-364-21)	500 MΩ最小. 500 MΩ Min.
耐电压 Dielectric Strength	将样品与适合之FPC连接, 相邻端子间需可承受250V AC(rms) 1分钟。(EIA-364-20) Mate applicable FPC, apply 250V AC(rms) for 1 minute between adjacent terminal or ground.(EIA-364-20)	目视外观无任何损坏异状 No Breakdown

6.2 机械特性 MECHANICAL PERFORMANCE

项目 ITEM	测试条件 TEST CONDITION	规格 REQUIRMENT
FPC保持力 FPC Retention Force	将盖子盖上, 与FPC连接, 以操作速度每分钟位移25±3mm进行FPC保持力测试。 Insert the actuator, pull the FPC at a rate of 25±3mm per minute.	Pos.x 0.30N最小 Pos.x 0.30N Min.
端子保持力 Terminal Retention Force	端子与Housing组装后, 以操作速度每分钟位移25±3mm将端子拔出Housing, 进行端子保持力测试。 Apply axial pull out force at the rate of 25±3 mm/minute on the terminal assembled in the housing.	3N最小. 3N Min.

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ZHE JIANG CHUANG DU ELECTRONICS CO.,LTD

REV. A

项目 ITEM	测试条件 TEST CONDITION	规格 REQUIRMENT
焊片保持力 Fitting Nail Retention Force	焊片与Housing组装后，以操作速度每分钟位移 $25\pm 3\text{mm}$ 将焊片拔出Housing，进行焊片保持力测试。 Apply axial pull out force at the rate of $25\pm 3\text{ mm/minute}$ on the Fitting Nail assembled in the housing.	1.0N最小. 1.0N Min

6.3 环境特性及其它性能 ENVIRONMENTAL PERFORMANCE AND OTHERS

项目 ITEM	测试条件 TEST CONDITION	规格 REQUIRMENT	
耐久性 Durability	将盖子与FPC反复连接，以每分钟小于10 cycles连续操作20次。 Insert and withdraw actuator up to 20 cycles at the speed rate of less than 10 cycles/minute.	接触阻抗 Contact Resistance	60mΩ最大. 60mΩ Max.
温度上升 Temperature Rise	量测通过FPC最大容许电流时，样品接触点之温升 (EIA-364-70 METHOD 2) Mate applicable FPC and measure the temperature rise of contact when the maximum AC rated current is passed.	温升 Temperature rise	30°C最大. 30°C Max.
耐振性 Vibration	通过DC电流1mA，位移相对距离1.5mm，振动周期10~55~10 Hz在1分钟内，持续2小时，方向在X,Y,Z轴做测试。(EIA-364-28 Condition I) Mate connectors and subject to the following vibration conditions, for period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1mA during the test. Amplitude : 1.5mm P-P Frequency : 10~55~10 Hz in 1 minute. Duration : 2 hours in each of X,Y,Z axes. (EIA-364-28 Condition I)	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ最大. 60mΩ Max.
		瞬间断电 Discontinuity	1 μ sec最大 1 μ sec Max.

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项目 ITEM	测试条件 TEST CONDITION	规格 REQUIRMENT	
耐冲击性 Shock	将样品与适合之FPC连接, 通过DC 1 mA测试条件, 连续测试3次。在X、Y、Z 3轴6个垂直方向施予重力加速度490m/s ² {50G} 冲击。 (EIA-364-27, test condition A) Mate applicable FPC and subject to the following shock conditions. 3 times of shocks shall be applied for each 6 directions along 3 mutually perpendicular axes, passing DC 1 mA current during the test. (Total of 18 shocks) Peak value : 490m/s ² {50G} (EIA-364-27, test condition A)	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.
		瞬间断电 Discontinuity	1 μ sec 最大 1 μ sec Max.
耐热性 Heat Resistance	将样品与适合之FPC连接, 置于环境温度85±2℃测试时间96小时, 再置放于室温下1~2小时。 Mate applicable FPC and expose to 85±2℃ for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.
耐寒性 Cold Resistance	将样品与适合之FPC连接, 置于环境温度-40±2℃, 测试时间96小时, 再置放于室温下1~2小时。 Mate applicable FPC and expose to -40±2℃ for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.

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项目 ITEM	测试条件 TEST CONDITION	规格 REQUIREMENT	
耐湿性 Humidity	将样品与适合之FPC连接，置于环境温度 $60\pm 2^{\circ}\text{C}$ ，相对湿度90~95%，测试时间96小时，再置放于室温下1~2小时。 Mate applicable FPC and expose to $60 \pm 2^{\circ}\text{C}$, relative humidity 90 to 95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ最大. 60mΩMax.
		耐电压 Dielectric Strength	需能符合耐电压测试 No Breakdown
		绝缘阻抗 Insulation t Resistance	30 MΩ 最小. 30 MΩ Min
冷热冲击 Temperature Cycling	将样品与适合之FPC连接，承受5 cycles冷热冲击后置放于室温下1~2小时。1 cycle time如下 a) $-55\pm 3^{\circ}\text{C}$ 30分钟 b) $+85\pm 3^{\circ}\text{C}$ 30分钟 Mate applicable FPC and subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. 1 cycle a) $-55\pm 3^{\circ}\text{C}$ 30minutes b) $+85\pm 3^{\circ}\text{C}$ 30minutes	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.
盐水喷雾 Salt Spray	将样品与适合之FPC连接，使用 $5\pm 1\%$ 浓度盐水，测试温度 $35\pm 2^{\circ}\text{C}$ ，测试时间 48 ± 4 小时,后于室温下使用清水冲洗后再干燥。 Mate applicable FPC and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed. NaCl solution Concentration : $5 \pm 1\%$ Spray time : 48 ± 4 hours Ambient temperature : $35 \pm 2^{\circ}\text{C}$	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.

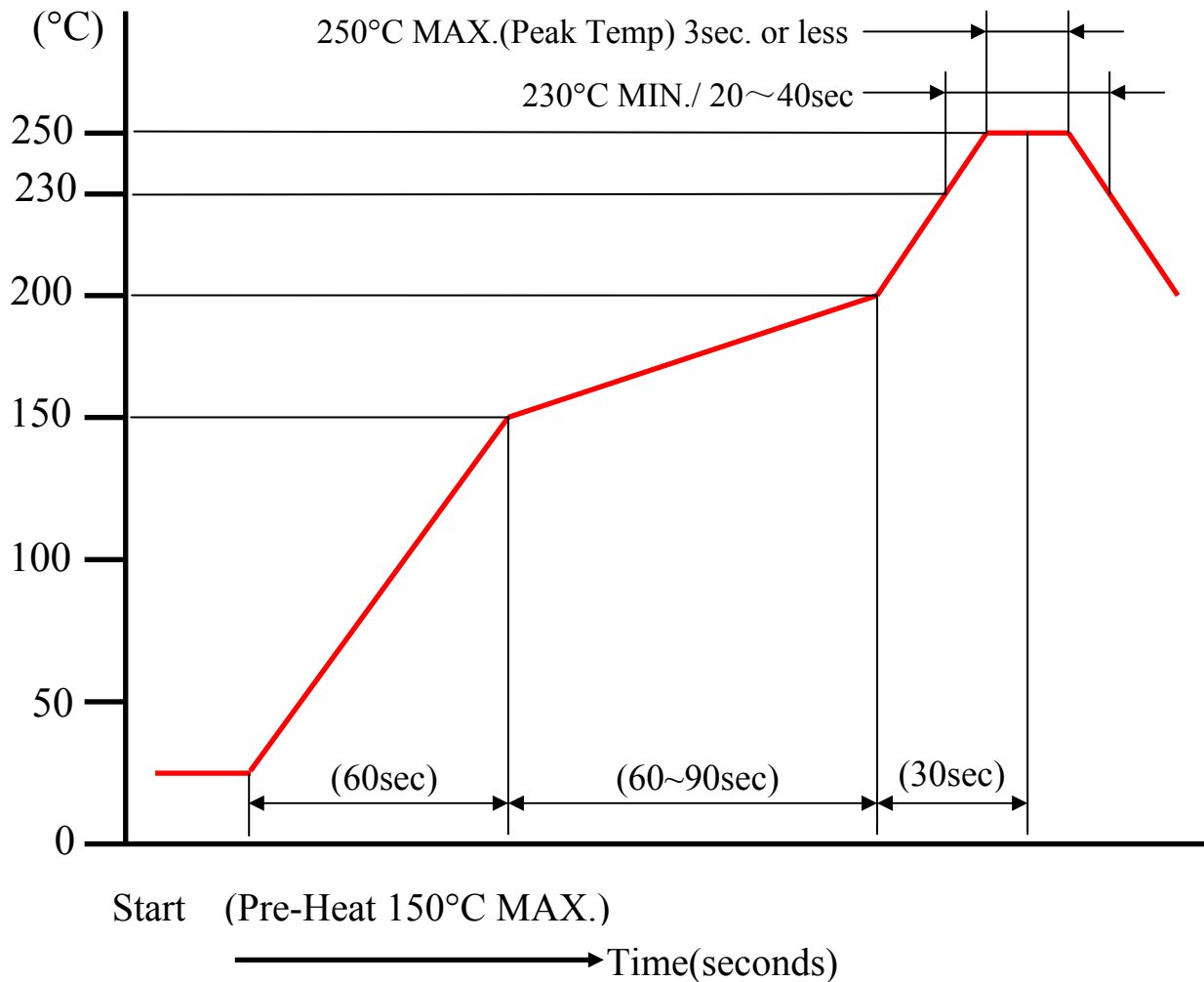
浙江创都电子科技有限公司

ZHE JIANG CHUANG DU ELECTRONICS CO.,LTD

REV. A

项目 ITEM	测试条件 TEST CONDITION	规格 REQUIRMENT	
二氧化硫(气体) SO2 Gas	将样品与适合之FPC连接, 将其置于50±5 ppm浓度二氧化硫气体中, 测试温度40±2°C, 测试时间24小时。 Mate applicable FPC and expose them to the following SO2 gas atmosphere. Temperature 40 ± 2°C Gas Density 50 ± 5 ppm Duration 24 hours	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.
氨(气体) NH3 Gas	暴露来自浓度28%阿摩尼亚之蒸发气体NH3中, 测试时间40分钟。 40 minutes exposure to NH3 gas evaporating from 28% Ammonia solution.	外观 Appearance	目视外观无任何损坏异状 NoDamage
		接触阻抗 Contact Resistance	60mΩ 最大. 60mΩ Max.
焊锡性 Solderability	锡温245±5°C, 将导电端子浸入锡炉液面至Housing距离锡面0.1mm位置, 焊锡时间3±0.5秒。 Tip of solder tails and fitting nails into the molten solder (held at 245±5°C) up to 0.1mm from the bottom of the housing for 3±0.5 seconds.	润湿性 Solder Wetting	润湿面积75%以上, 并不得有漏焊针孔现象 75% of immersed area must show no voids, pin holes.
焊锡耐热性 Resistance to Soldering Heat	使用红外线回焊时请参考第7 When reflowing Refer to paragraph 7. 使用烙铁手焊时须可符合下述焊锡条件 Soldering iron method 0.2mm from terminal tip and fitting nail tip. Soldering time : 5 seconds Max. Solder temperature : 370 ~ 400°C	外观 Appearance	目视外观无任何损坏异状 NoDamage

【7】 红外线回焊温度曲线 INFRARED REFLOW CONDITION

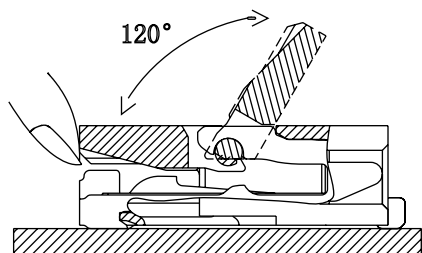


温度条件TEMPERATURE CONDITION GRAPH
(基板表面温度) (TEMPERATURE ON BOARD PATTERN SIDE)

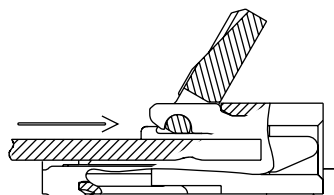
掀盖式产品操作注意事项

Instruction upon usage of zif essay on type

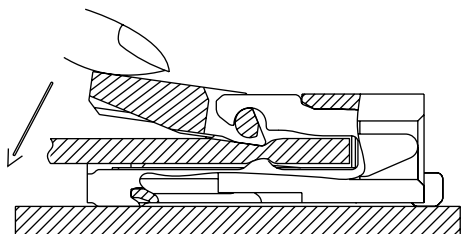
步骤1:使用拇指或食指, 将上盖往上掀开。
Step 1:Use the thumb or the forefinger, raise the topcover up.



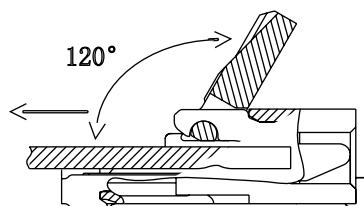
步骤2:FPC 金属指朝下平行插入连接器中。
Step 2:FPC gets along with conductivity down.The parallel one inserts it in the connector



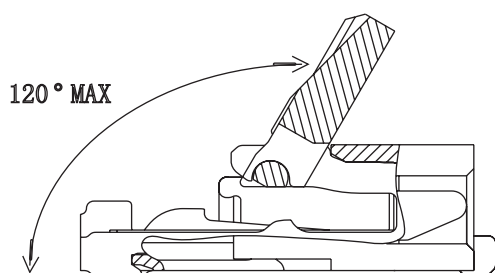
步骤3:轻压上盖往下旋转至定位, 直到FPC 完全插入且没有移动。
Step 3: Press the top cover lightly and rotate down tomake a reservation ,until FPC is totallyinserted and not moved .



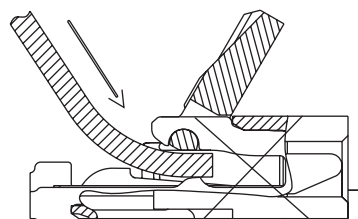
步骤4:FPC退出时, 小心掀起上盖, 依序将FPC退出。
Step 4:Lift the top cover carefully,withdraw FPC.



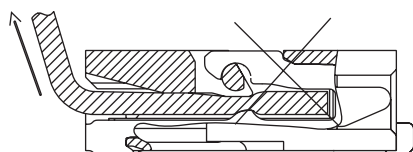
警告:旋转的角度不可大于120 度。
Warning:The whirling angle can't be greater than 120degrees.



警告:当FPC插入的角度过大时, 可能会引起导通不良。
Warning:When the angle that FPC inserts in is askew,may cause electrical discontinuity.

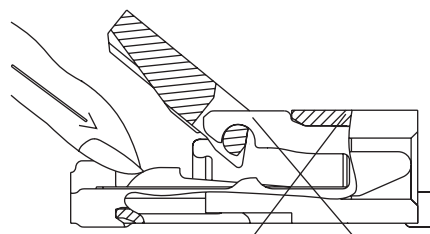


警告:向上拉扯的力量不要超过0.04N/pin max.
Warning:The strength of dragging upwards don't exceed 0.04N/pin max .



Load 0.04N / pin Max.

警告:开启连接器上盖时, 不要使用过度的力量, 避免接触到端子。
Warning:While opening the connector and lifting and covering , don't use excessive strength and avoid touching the end son .



Test Report

Report No. ECL03H000870002

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Applicant ZHE JIANG HEFEENG TECHNOLOGY.CO.LTD
Address THESECONDINDUSTRIALZONE,DANXITOWN,YUE QING
CITY,ZHEJIAGNPROVINCE,CHINA

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name plastic core
Color white
Material LCP
Sample Received Date Mar. 5, 2015
Testing Period Mar. 5, 2015 to Mar. 12, 2015

Test Requested As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyl(PBBs) , Polybrominated Diphenyl Ethers(PBDEs) in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES
Mercury (Hg)	IEC 62321-4:2013 Ed.1.0	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex C	UV-Vis
Polybrominated Biphenyl(PBBs)	IEC 62321:2008 Ed.1 Annex A	GC-MS
Polybrominated Diphenyl Ethers(PBDEs)	IEC 62321:2008 Ed.1 Annex A	GC-MS

Test Result(s) Please refer to the following page(s).

Tested by

Sha Chen

Reviewed by

Lin Zhang

Approved by

Wei Miao

Date

Mar. 12, 2015



Wei Miao
Approved Signatory

No. R138202007

Centre Testing International(Ningbo)Co.,Ltd. 7-8/F.,Building A,No.750.Chuangyuan Road,Gaoxin District,Ningbo,Zhejiang,China

Test Report

Report No. ECL03H000870002

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Test Result(s)

Tested Item(s)	Result	MDL
Lead (Pb)	N.D.	2 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg
Mercury (Hg)	N.D.	2 mg/kg
Hexavalent Chromium (Cr(VI))	N.D.	2 mg/kg

Tested Item(s)	Result	MDL
Polybrominated Biphenyl(PBBs)		
Monobromobiphenyl	N.D.	5 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg
Tribromobiphenyl	N.D.	5 mg/kg
Tetrabromobiphenyl	N.D.	5 mg/kg
Pentabromobiphenyl	N.D.	5 mg/kg
Hexabromobiphenyl	N.D.	5 mg/kg
Heptabromobiphenyl	N.D.	5 mg/kg
Octabromobiphenyl	N.D.	5 mg/kg
Nonabromobiphenyl	N.D.	5 mg/kg
Decabromobiphenyl	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
Polybrominated Diphenyl Ethers(PBDEs)		
Monobromodiphenyl ether	N.D.	5 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg
Tribromodiphenyl ether	N.D.	5 mg/kg
Tetrabromodiphenyl ether	N.D.	5 mg/kg
Pentabromodiphenyl ether	N.D.	5 mg/kg
Hexabromodiphenyl ether	N.D.	5 mg/kg
Heptabromodiphenyl ether	N.D.	5 mg/kg
Octabromodiphenyl ether	N.D.	5 mg/kg
Nonabromodiphenyl ether	N.D.	5 mg/kg
Decabromodiphenyl ether	N.D.	5 mg/kg

Tested Sample/Part Description Beige-white plastic

Remark: The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

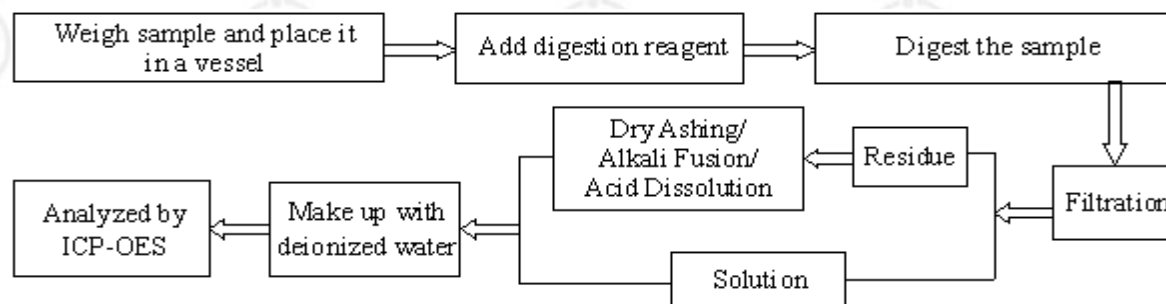
Test Report

Report No. ECL03H000870002

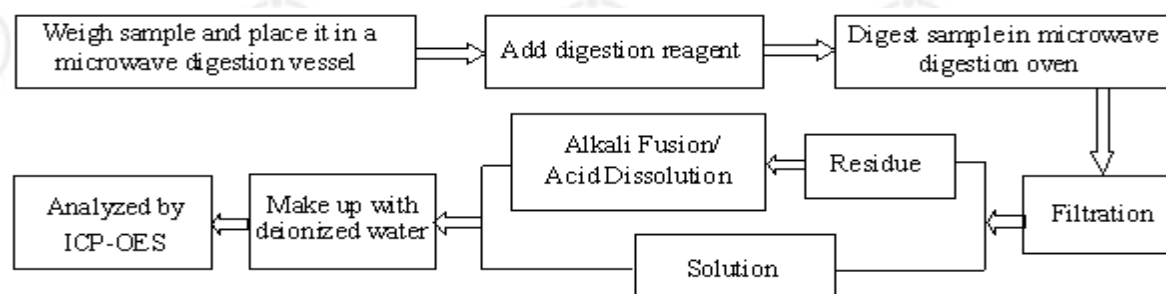
Page 3 of 4

Test Process

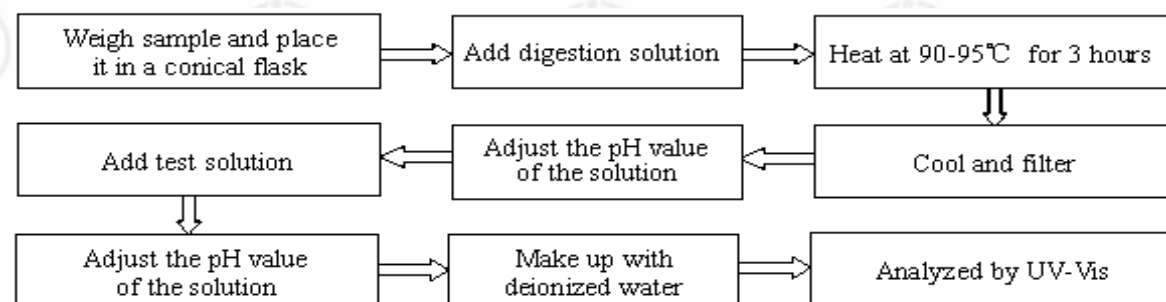
1. Lead (Pb), Cadmium (Cd)



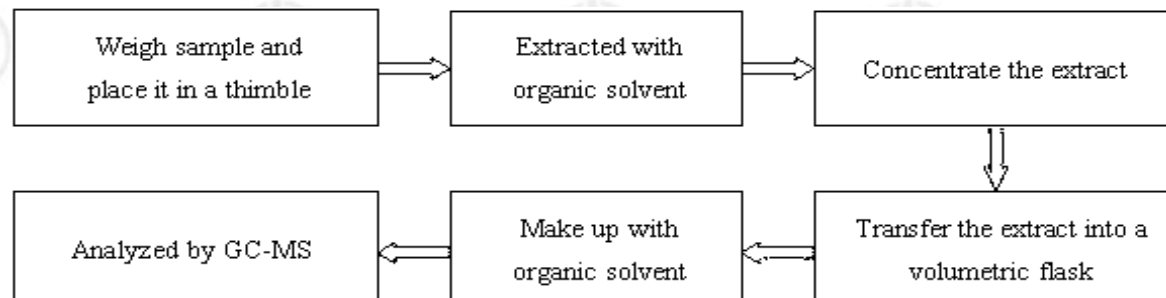
2. Mercury (Hg)



3. Hexavalent Chromium(Cr(VI))



4. Polybrominated Biphenyl(PBBs) , Polybrominated Diphenyl Ethers(PBDEs)



Test Report

Report No. ECL03H000870002

Page 4 of 4

Photo(s) of the sample(s)



*** End of report ***

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Test Report

Report No. ECL03H000870005

Page 1 of 4

Applicant ZHEJIANG HEFEENG TECHNOLOGY CO., LTD
Address THESECOND INDUSTRIAL ZONE, DANXITOWN, YUE QING
CITY, ZHEJIANG PROVINCE, CHINA

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name Rear cover
Color Black
Material LCP
Sample Received Date Mar. 5, 2015
Testing Period Mar. 5, 2015 to Mar. 12, 2015

Test Requested As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyl (PBBs), Polybrominated Diphenyl Ethers (PBDEs) in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	IEC 62321-5:2013 Ed.1.0	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013 Ed.1.0	ICP-OES
Mercury (Hg)	IEC 62321-4:2013 Ed.1.0	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321:2008 Ed.1 Annex C	UV-Vis
Polybrominated Biphenyl (PBBs)	IEC 62321:2008 Ed.1 Annex A	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321:2008 Ed.1 Annex A	GC-MS

Test Result(s) Please refer to the following page(s).

Tested by

Sha Chen

Reviewed by

Lin Zhang

Approved by

Wei Miao

Date

Mar. 12, 2015



Wei Miao
Approved Signatory

No. R138202007

Centre Testing International (Ningbo) Co., Ltd. 7-8/F., Building A, No. 750 Chuangyuan Road, Gaoxin District, Ningbo, Zhejiang, China

Test Report

Report No. ECL03H000870005

Page 2 of 4

Test Result(s)

Tested Item(s)	Result	MDL
Lead (Pb)	N.D.	2 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg
Mercury (Hg)	N.D.	2 mg/kg
Hexavalent Chromium (Cr(VI))	N.D.	2 mg/kg

Tested Item(s)	Result	MDL
Polybrominated Biphenyl(PBBs)		
Monobromobiphenyl	N.D.	5 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg
Tribromobiphenyl	N.D.	5 mg/kg
Tetrabromobiphenyl	N.D.	5 mg/kg
Pentabromobiphenyl	N.D.	5 mg/kg
Hexabromobiphenyl	N.D.	5 mg/kg
Heptabromobiphenyl	N.D.	5 mg/kg
Octabromobiphenyl	N.D.	5 mg/kg
Nonabromobiphenyl	N.D.	5 mg/kg
Decabromobiphenyl	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
Polybrominated Diphenyl Ethers(PBDEs)		
Monobromodiphenyl ether	N.D.	5 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg
Tribromodiphenyl ether	N.D.	5 mg/kg
Tetrabromodiphenyl ether	N.D.	5 mg/kg
Pentabromodiphenyl ether	N.D.	5 mg/kg
Hexabromodiphenyl ether	N.D.	5 mg/kg
Heptabromodiphenyl ether	N.D.	5 mg/kg
Octabromodiphenyl ether	N.D.	5 mg/kg
Nonabromodiphenyl ether	N.D.	5 mg/kg
Decabromodiphenyl ether	N.D.	5 mg/kg

Tested Sample/Part Description Black plastic

Remark: The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

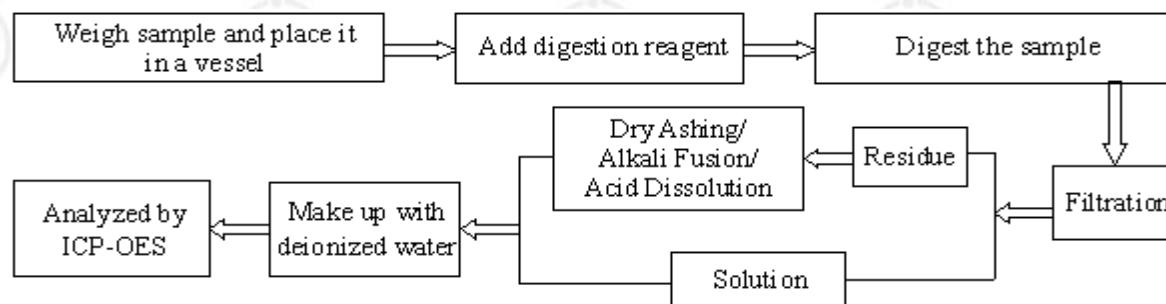
Test Report

Report No. ECL03H000870005

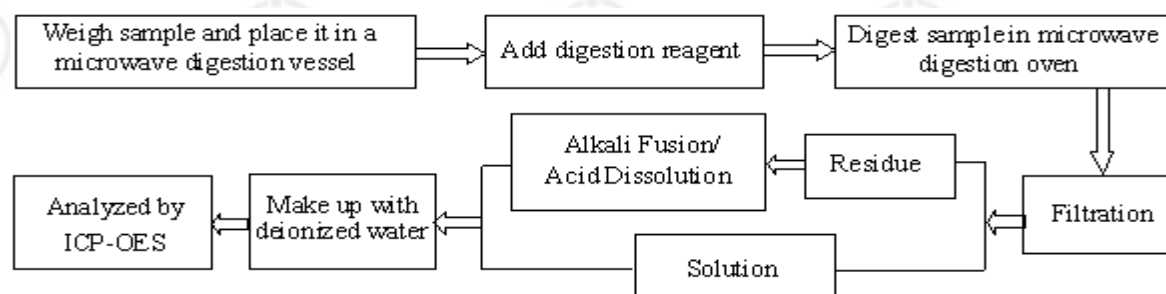
Page 3 of 4

Test Process

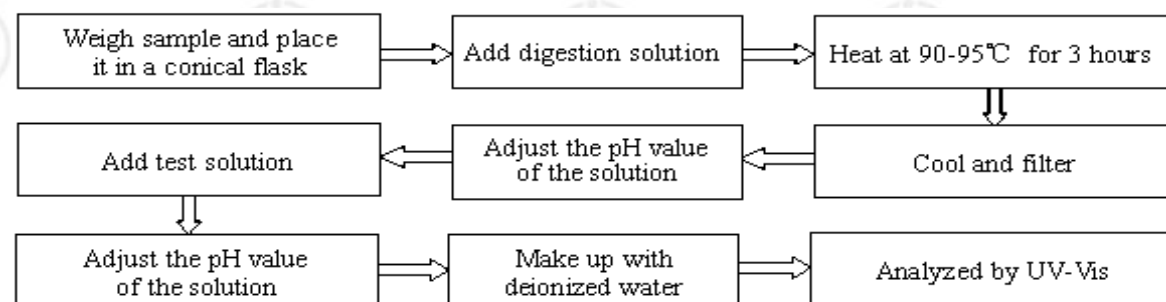
1. Lead (Pb), Cadmium (Cd)



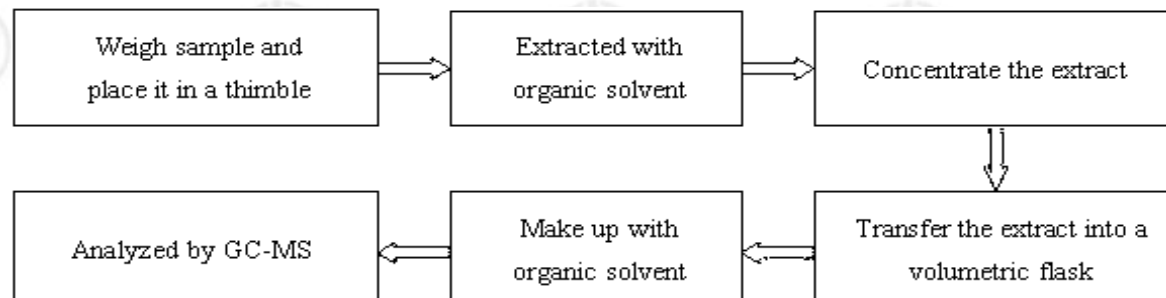
2. Mercury (Hg)



3. Hexavalent Chromium(Cr(VI))



4. Polybrominated Biphenyl(PBBs) , Polybrominated Diphenyl Ethers(PBDEs)



Test Report

Report No. ECL03H000870005

Page 4 of 4

Photo(s) of the sample(s)



*** End of report ***

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测试报告

No. SHAEC1412283904

日期: 2014年07月03日 第1页,共4页

宁波兴业盛泰集团有限公司/宁波兴业鑫泰新型电子材料有限公司
浙江省慈溪经济开发区杭州湾新区金溪路2-9号

以下测试之样品是由申请者所提供及确认: 锡磷青铜

SGS工作编号: SP14-020042 - SH
型号: C5191(QSn6.5-0.1) 6/1-4
成分: 铜基合金/Cu Sn P
样品接收日期: 2014年07月01日
测试周期: 2014年07月01日 - 2014年07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

Marry Ma 马广媛
批准签署人

本报告是编号为SHAEC1412283903报告的中文版本。



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HL: (86-21) 61402594 HL: (86-21) 54500353 e sgs.china@sgs.com

测试报告

No. SHAEC1412283904

日期: 2014年07月03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
SN1	SHA14-122839.002	铜色金属

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

- 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	单位	MDL	002
镉 (Cd)	100	mg/kg	2	ND
铅(Pb)	1000	mg/kg	2	13
汞 (Hg)	1000	mg/kg	2	ND
六价铬(CrVI)	-	-	◇	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
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能代表测试时样品含六价铬的状态.



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Testing Center (Shanghai) Co., Ltd.

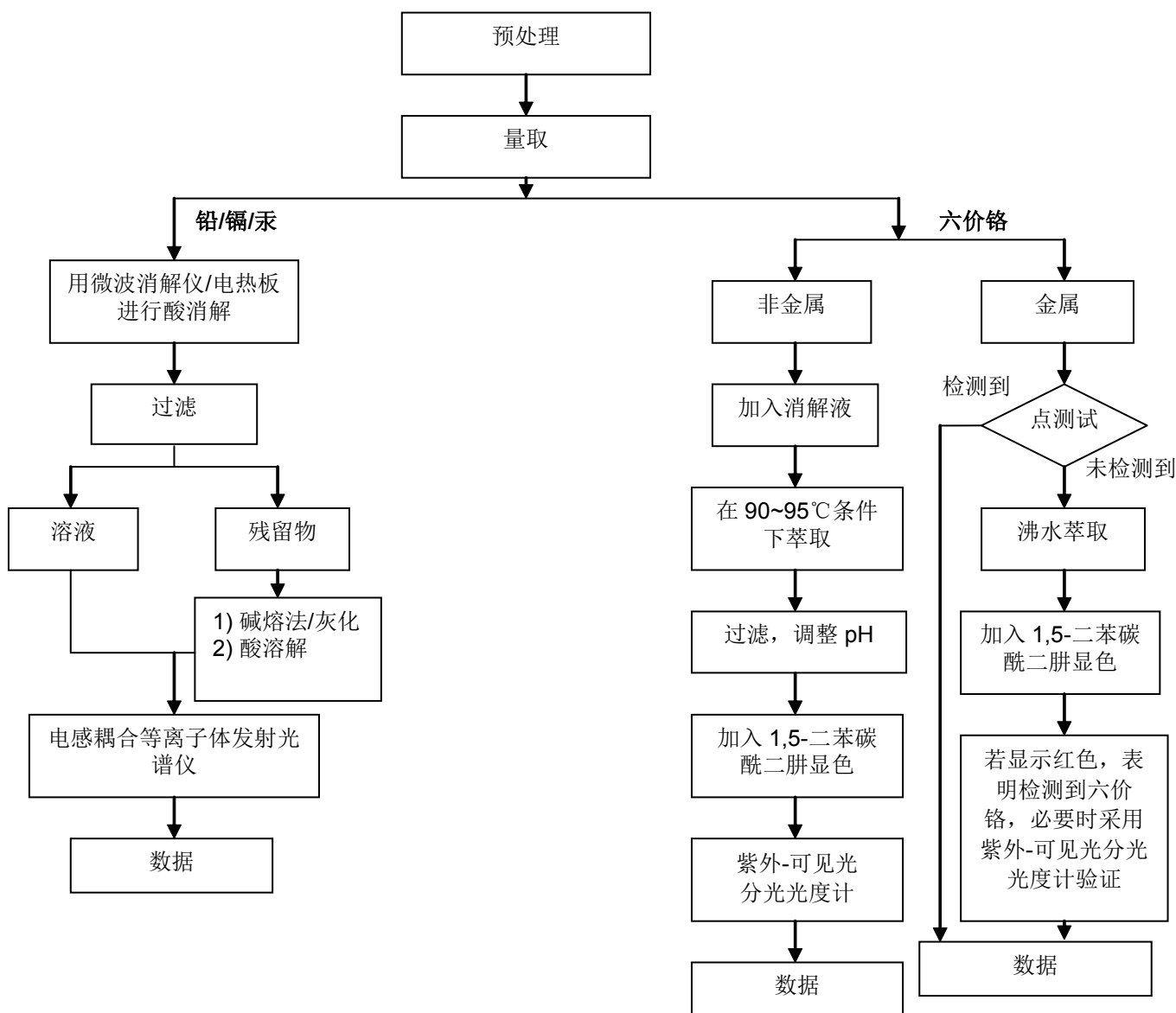
3rd Building, No. 889 Yishan Road Xuhui District, Shanghai China 200233
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233

t E&E (86-21) 61402553 f E&E (86-21) 64953679 www.sgsgroup.com.cn
HL: (86-21) 61402594 HL: (86-21) 54500353 e sgs.china@sgs.com

附件

RoHS 测试流程图

- 1) 分析人员: 施青/汪红新/王晓艳
- 2) 项目负责人: 张春华
- 3) 样品按照下述流程被完全消解 (六价铬测试除外)



测试报告

No. SHAEC1412283904

日期: 2014年07月03日 第4页,共4页

样品照片:



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*** 报告完 ***



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Testing Center, 3rd Floor, No. 889 Yishan Road Xuhui District, Shanghai China 200233

中国·上海·徐汇区宜山路889号3号楼 邮编: 200233

t E&E (86-21) 61402553 f E&E (86-21) 64953679 www.sgs.com
HL: (86-21) 61402594 HL: (86-21) 54500353 e sgs.china@sgs.com

Test Report

Report No. ECL01H009619002

Page 1 of 4

Applicant ZHE JIANG HEFEENG TECHNOLOGY.CO.LTD

Address THESECONDINDUSTRIALZONE,DANXITOWN,YUE QING
CITY,ZHEJIANGPROVINCE,CHINA

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name Tinned terminal (Fog tin)

Sample Received Date Mar. 6, 2015

Testing Period Mar. 6, 2015 to Mar. 10, 2015

Test Requested As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium(Cr(VI)) in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
Cadmium (Cd)	Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
Mercury (Hg)	Refer to IEC 62321-4:2013 Ed.1.0	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis

Test Result(s) Please refer to the following page(s).

Tested by

Wang Dong

Reviewed by

Li Chunxian

Approved by

Su Hongwei

Date

Mar. 10, 2015



Su Hongwei

Senior Laboratory Manager

No. R108722121

Centre Testing International Co.,Ltd. Shanghai Branch

No.1996,Xinjinqiao Road, Pudong New District, Shanghai, China

Test Report

Report No. ECL01H009619002

Page 2 of 4

Test Result(s)

Tested Item(s)	Result	MDL
Lead (Pb)	49 mg/kg	2 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg
Mercury (Hg)	N.D.	2 mg/kg
Hexavalent Chromium(Cr(VI))	Negative	/

Tested Sample/Part Description Silvery plating

Remark:

- MDL = Method Detection Limit
- N.D. = Not Detected (<MDL)
- mg/kg = ppm = parts per million
- Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm² sample surface area used.

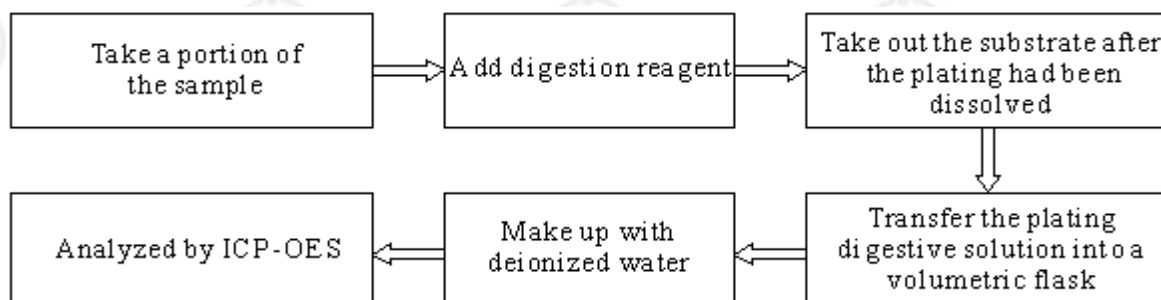
Test Report

Report No. ECL01H009619002

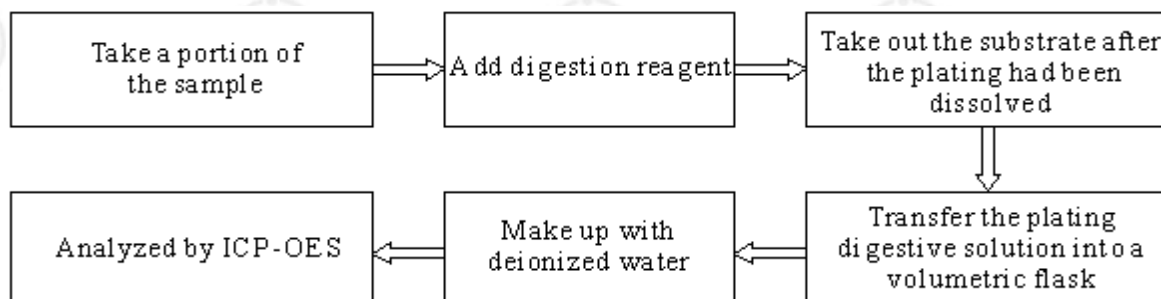
Page 3 of 4

Test Process

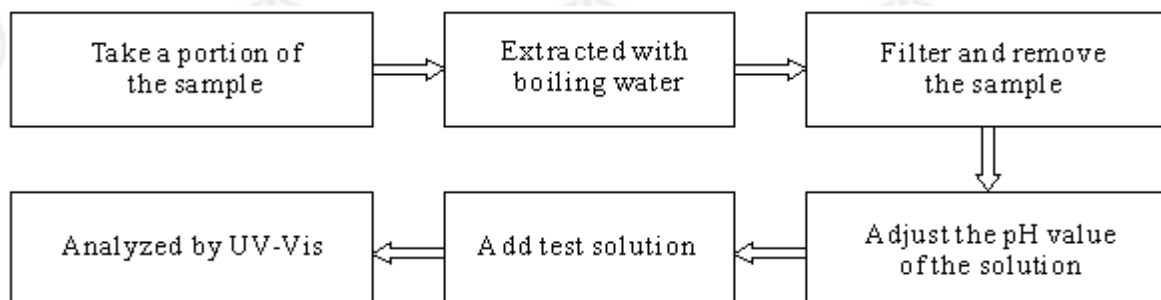
1. Lead (Pb), Cadmium (Cd)



2. Mercury (Hg)



3. Hexavalent Chromium(Cr(VI))

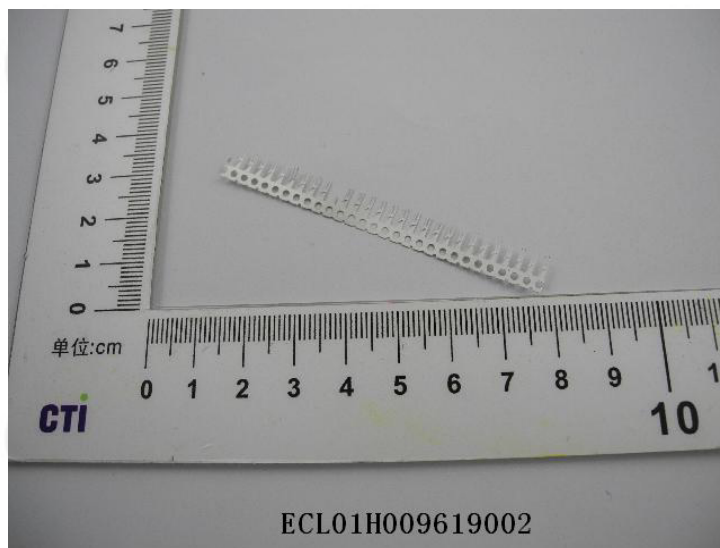


Test Report

Report No. ECL01H009619002

Page 4 of 4

Photo(s) of the sample(s)



*** End of report ***

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Test Report

Report No. ECL01H009619003

Page 1 of 4

Applicant ZHE JIANG HEFEENG TECHNOLOGY.CO.LTD

Address THESECONDINDUSTRIALZONE,DANXITOWN,YUE QING
CITY,ZHEJIANGPROVINCE,CHINA

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name Tinned lug
Sample Received Date Mar. 6, 2015
Testing Period Mar. 6, 2015 to Mar. 10, 2015

Test Requested As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium(Cr(VI)) in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
Cadmium (Cd)	Refer to IEC 62321-5:2013 Ed.1.0	ICP-OES
Mercury (Hg)	Refer to IEC 62321-4:2013 Ed.1.0	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis

Test Result(s) Please refer to the following page(s).

Tested by

Wang Dong

Reviewed by

Li Chunxian

Approved by

Su Hongwei

Date

Mar. 10, 2015



Su Hongwei

Senior Laboratory Manager

No. R108722121

Centre Testing International Co.,Ltd. Shanghai Branch

No.1996,Xinjinqiao Road, Pudong New District, Shanghai, China

Test Report

Report No. ECL01H009619003

Page 2 of 4

Test Result(s)

Tested Item(s)	Result	MDL
Lead (Pb)	43 mg/kg	2 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg
Mercury (Hg)	N.D.	2 mg/kg
Hexavalent Chromium(Cr(VI))	Negative	/

Tested Sample/Part Description Silvery plating

Remark:

- MDL = Method Detection Limit
- N.D. = Not Detected (<MDL)
- mg/kg = ppm = parts per million
- Negative = Absence of Cr(VI) , the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm² sample surface area used.

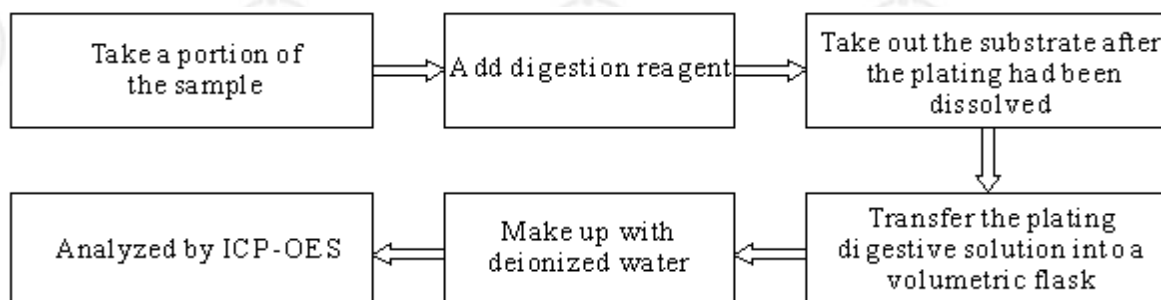
Test Report

Report No. ECL01H009619003

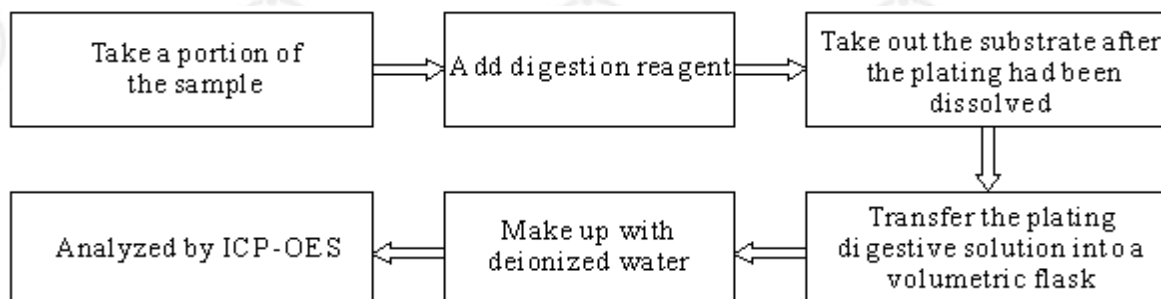
Page 3 of 4

Test Process

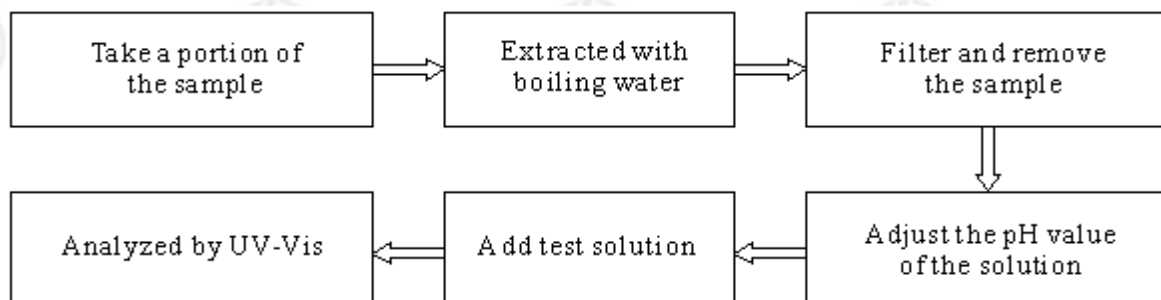
1. Lead (Pb), Cadmium (Cd)



2. Mercury (Hg)



3. Hexavalent Chromium(Cr(VI))

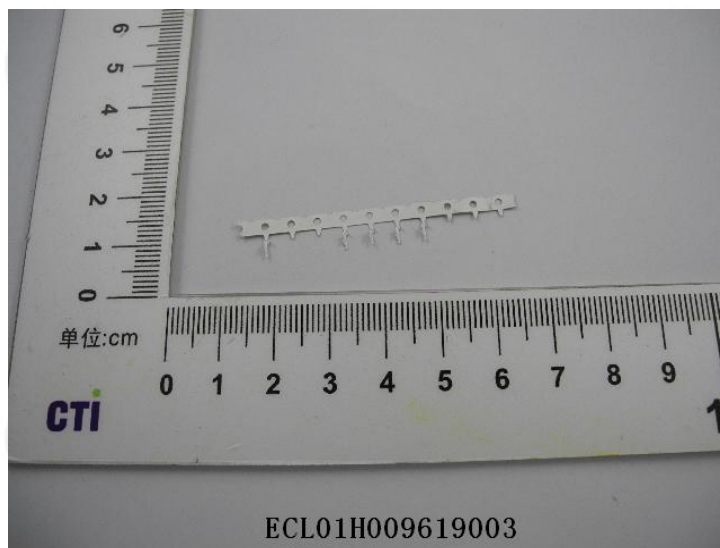


Test Report

Report No. ECL01H009619003

Page 4 of 4

Photo(s) of the sample(s)



*** End of report ***

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乐清市远方电子电镀有限公司

物质安全资料 (MSDS)

1、化学产品及企业标识:

化学产品俗名: 氨基磺酸镍 (NICKEL SULFAMATE) $\text{Ni}(\text{NH}_2\text{SO}_3) \cdot 2.4\text{H}_2\text{O}$

化学产品代码: TAK05-020

企业名称: 乐清市远方电子电镀有限公司

电话: (0577) 62357000

传真: (0577) 62359000

紧急电话:

2、配料的组分/有关数据

分子式: $\text{Ni}(\text{NH}_2\text{SO}_3)_2$

CAS: 13770-89-3

EINECS: 237-396-1

英文名: Nickel sulfamate

物化性质: 透明深绿色溶液

物质含量: 100%

分子量: 322.93

3、危险性说明

危险性/对健康的危害性

健康危害: 本品对眼和呼吸道有刺激性。对皮肤有刺激性和致敏作用。口服刺激消化道, 引起呕心、呕吐、惊厥。

环境危害: 燃爆危险, 本品易燃, 有毒, 具刺激性, 具致敏性。

4、急救措施:

皮肤接触: 脱去污染的衣着, 用肥皂水和清水彻底冲洗皮肤。

眼睛接触: 提起眼睑, 用流动清水或生理盐水冲洗, 就医。

呼吸吸入此化学剂: 迅速脱离现场至空气新鲜处。保持呼吸道通畅, 如呼吸困难, 给输氧。
如呼吸停止立即进行人工呼吸, 就医。

食入: 饮足量温水, 催吐, 就医。

5、消防措施:

危险特性: 遇高热, 明火或与氧化剂混合, 经摩擦, 撞击有引起燃烧爆炸的危险。在高温时, 若为汞盐, 强酸, 碱土金属, 氢氧化物及卤化物等污染后, 有可能发生爆炸。

有害燃烧产物: 一氧化碳 二氧化碳

灭火方法: 采用水、抗溶性泡沫、二氧化碳、干粉、沙土灭火。

6、排除故障的措施:

应急处理: 隔离泄漏污染区, 限制出入, 切断火源。建议应急处理人员带防尘面具, 穿防毒服。不要直接接触泄漏物。

小量泄漏：用洁净的铲子收集于干燥、洁净、有盖的容器中。

大量泄漏：收集回收货运至废物处理厂所处置。

.1.

7、此化学剂的装运和储存

操作注意事项：密闭操作，局部排风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员佩戴自吸过滤式防尘口罩，佩戴化学安全防护眼睛，穿透气型防毒服，戴防化学手套。远离火种、热源，工作场所严禁吸烟。使用防暴型的通风系统和设备。避免产生粉尘。避免与氧化剂、碱类接触。搬运时要轻装轻卸，防止包装及容器损坏。配备相应品种和数量的消防器材及泄漏应急处理设备。倒空的容器可能残留有害物质。

储存注意事项：储存于阴凉、通风的库房。远离火种、热源。包装密封，应与氧化剂，碱类，食用化学品分开存放，切忌混储。采用防暴型照明，通风设施。禁止使用易产生火花的机械设备和工具。储区应备有合适的材料收容泄漏物。

8、接触控制/人体防护

监测方法：

工程控制：加强通风。

呼吸系统防护：在通风不足的地方使用，佩戴自吸过滤式防酸口罩。

眼睛防护：佩戴化学安全防护眼镜。

身体防护：穿透气型防毒服。

手防护：佩戴化学手套。

其他防护：工作现场严禁吸烟。避免长期反复接触。定期体检，注意个人清洁卫生。

9、此化学剂的物理性质和化学性质

形状：液体

颜色：淡黄色

溶水性：可溶于水

相对密度：1.55

熔点℃：-60

沸点℃：>109

10、稳定性和可反应性

稳定性：稳定。

此化学剂需避免接触的物质：碱、氰化物和反应材料

避免：避免高温

危害分解产物：如果温度超过 200 度热分解物为硫的氧化物和碳氧化物，该产品在室温下稳定。

11、有关此化学剂毒性的资料

请参阅第 3 章节的此化学剂的危险性和对人体的危害性。

12、有关生态的资料

生态毒性：

污染水质：不确定

13、有关排污的说明

咨询当地有关排污的法规和要求。

废物排放：按照当地有关的法规和要求排污。

14、有关运输的资料

UN 编码：NA

UN 运送名称：NA

UN 等级：NA

UN 包装：25KG

包装方法：小开口钢桶；螺纹口玻璃瓶、铁盖压口玻璃瓶、塑料瓶或金属桶（罐）外普通木箱；螺纹口玻璃瓶、塑料瓶或镀锡薄钢板桶（罐）外满底板花格箱、纤维板箱或胶合板箱。

运输注意事项：运输前应检查包装容器是否完整、密封，运输过程中要确保容器不泄漏、不倒塌、不坠落、不损坏。严禁与碱类、氧化剂、食品及食品添加剂混运。运输时运输车辆应配备相应品种和数量的消防器材及泄漏应急处理设备。运输途中应防曝晒、雨淋、防高温。

15、有关法规的资料

有关法规：化学危险物品安全管理条例(1987 年 2 月 17 日国务院发布)，化学危险物品安全管理条例实施细则（化劳发「1992」677 号），工作场所安全使用化学品规定等法规（「1996」劳动部发 423 号），针对化学危险品的安全使用、生产、储存、运输、装卸等方面均作了相应规定；常用危险化学品的分类及标志（GB13690-92）将该物质化为第 6.1 类毒害品。

有关安全的事宜：

S 24/25 此化学剂避免接触眼睛和皮肤。

16、其他有关的资料

警告：此安全数据清单中仅涉及指定化学产品的有关资料，准确、可用，但作为建议或推荐，仅供参考，不能作为产品使用的担保，此产品的使用情况取决于用户的操作使用。而且，此资料中的有关说明不适用于与现有专利所涉及物质和用途不一致的产品。

制造（供应）商名称：远方电子电镀有限公司

地址：浙江省乐清市虹桥镇东工业区幸福东路 1002 号

电话：（0577）62357000 传真：（0577）62359000

紧急联络人：方兴峰

公司盖章：

填表时间：2011 年 1 月 8 日

一、物品与厂商资料

物品名称：锡磷青铜带
制造商及供应商名称、地址及电话： 公司：宁波兴业盛泰电子金属材料有限公司 地址：浙江省宁波市杭州湾经济开发区金溪路 电话：(0574) 63073314
部门：质量服务部

二、成分辨识资料

化学性质：

锡磷青铜带的化学成分，%											
合 金	Sn	Al	Zn	Ni	Fe	Pb	P	As	Si	Cu	杂质 总和
QSn4-0.3 [C51100]	3.5~4.9	—	0.30	0.2	0.10	0.05	0.03~0.35	—	—	余量	—
QSn6.5-0.1 [C5191]	6.0~7.0	0.002	0.3	0.2	0.05	0.02	0.10~0.25	—	—	余量	0.1
QSn6.5-0.4	6.0~7.0	0.002	0.3	0.2	0.02	0.02	0.26~0.40	—	—	余量	0.1
QSn8-0.3 [C5210]	7.0~9.0	—	0.20	0.2	0.10	0.05	0.03~0.35	—	—	余量	—

三、危害辨识资料

辨识符和危害描述：金属性固体, 易碰伤身体
对人体和环境的特殊危害：易碰伤身体
有害影响和表现：易碰伤身体

四、急救措施

不同暴露途径之急救方法： · 吸入(因深加工而形成的粉尘和气体)：呼吸新鲜空气，若有不适找医生就诊 · 皮肤接触：不会产生健康危害 · 眼睛接触：睁大眼睛，并用水冲洗数分钟 · 食入：若有持续不适找医生就诊
对医师之提示： 无

五、灭火措施

适用灭火剂： 不易燃烧

灭火时可能遭遇之特殊危害： 无
消防人员之特殊防护设备：防护衣、防护手套等
其它提示： 无

六、洩漏处理方法

个人应注意事项： 无
环境注意事项： 无
清理方法： 无
其它提示： 无

七、安全处置与储存方法

处置：
安全处置有关信息：注意安全
火灾及泄漏保护的有关信息： 无泄露
储存：
单独贮存；禁止与强氧化剂、酸、碱等物质混合储存； 不要在潮湿和有水蒸气的环境下储存； 远离热源和引火源；检查所有新进铜带，清楚标示及无受损； 须具备随时可用于火灾的紧急处理装备

八、暴露预防及个人防护措施

工程控制： -
呼吸系统防护：供气式呼吸防护具
手部防护：耐磨防护手套防护衣

九、物理及化学性质

化学性能：化学稳定性强，对稀硫酸有较强的抗蚀性； 易于在流速较大的潮湿水蒸气中腐蚀； 高温下，易与 Cl、Br、F 及其氢化物、干燥 CO ₂ 发生反应，形成挥发性化合物。	
物理特性：具有较高的弹性、耐磨性和抗磁性， 在热态和冷态均可压力加工，易于焊接和钎焊， 可削性、可塑性、延展性、铸造性较好， 有较强的热导率、电导率，	
物质状况：固体	形状：带状
分解温度：996℃	气味：无味
密度：8.8 g/cm ³	溶解性：不溶于水

十、安定性及反应性

应避免之状况：避免加热，与流速大的水蒸气混合
应避免之物质：强氧化剂、水蒸气

危害分解物： 无

十一、毒性资料

急毒性：无

其它：

十二、生态资料

对水的危害等级： 无

概述：

十三、废弃处置方法

1· 参考相关法规处理，符合相关环保法规

2· 作为产业废弃物可再回收利用

十四、运输资料

概述：搬运时注意安全防护，严禁摔落、互相碰撞、损伤；
不要用油污的手接触铜带；
其他根据消防法、道路安全运输等法令实施。

十五、法规资料

EC 指令有关法规辨识：ROSH 指令

其它：GB/T5231-2001 加工铜及铜合金化学成分和产品形状

《部件和材料中环境管理物质 管理规定》（索尼 SS-00259-0-2005）

本地法规：环境保护法' 固体废弃污染环境防治法' 消防法

道路交通安全规则：

作业环境空气中有害物质含量的有关技术指令：大气污染防治法

对水的污染等级：无

对水没有危害性/污染无

十六、其他资料

本资料表阐述了就环保和劳工安全方面我们对处于出货时状态下的产品的现有知识。

然而，本资料表不就某些产品性能做出任何担保，不具有任何法律约束性质。

制表：2010 年 1 月

MATERIAL SAFETY DATA SHEET (MSDS)

Production:	LCP M-401	Page of 1 - 6
MSDS NO.: 110401	Version 1.0	Revision Date: 2011/08/08

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

CHEMICAL PRODUCT NAME : LCP M-401

NAME OF COMPANY : DZT Engineering Plastics Tech. Co.,Ltd

ADDRESS : Building 2 Zhichong Industrial Park, Hi-Tech Zone,
Jiangmen City, Guangdong Province, China

SECTION IN CHARGE : Quality Assurance Department

TEL/FAX : +86-750-3689920/+86-750-3689921

EMERGENCY TEL : +86-750-3689705

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE/MIXTURE : Mixture

CHEMICAL NAME : Not open

SYNONYM(S) : Aromatic Liquid Crystal Polymer(LCP)

CAS REGISTRY NUMBER : Not open

INGREDIENTS AND COMPOSITION : LCP resin 55%, Glass fiber 25%, Mine fiber 20%

ADDITIVES : < 2%

CHEMICAL FORMULA : Not open

FILE NO. IN OFFICIAL GAZETTE : Not open

UN CLASS : Not applicable

UN NUMBER : Not applicable

3. HAZARDS IDENTIFICATION

CLASS OF HAZARDOUS CHEMICALS FOR MSDS IN CHINA: Not applicable

PHYSICAL AND CHEMICAL HAZARDS: Neither dangerous reaction nor explosion can be caused under normal conditions.

4. FIRST-AID MEASURES

➤ EYE CONTACT

Cool and rinse the eye with clean water for at least 15 minutes when the eyes had contact with molten polymer.

In case of wearing contact lenses, remove the lenses as soon as possible, and ask a physician for advice.

When the eye had contact with the polymer in an ordinary solid form, rinse the eye with clean water without delay.

If the discomfort persists, ask a physician for advice.

➤ SKIN CONTACT

Cool the contacted skin with clean water without delay, if a contact with the polymer in a molten form. Do not remove the solid resin on the skin.

➤ INHALATION

When a gas generated from the molten polymer has been inhaled, remove fresh air without delay and wait until the victim is recovered.

If sick feeling continues, ask a physician for advice.

➤ **INGESTION**

Help to vomit as much as possible .If sick feeling continues, and ask a physician for advice.

5. FIRE-FIGHTING MEASURES

➤ **FIRE-EXTINGUISHING MEASURES:**

Extinguish the fire with water. A method of extinguishing an ordinary fire may be applied.

Caution:

- 1) Incomplete combustion leads to generation of toxic gases such as carbon monoxide, in addition to carbonic acid gas and water.
- 2) In case the fire gained force, use a gas mask or other protective equipment.
- 3) Do not apply water directly to processing machines.

➤ **FIRE- EXTINGUISHING AGENTS:**

Water, foam fire-extinguishing agent, powder fire-extinguishing agent, and carbon dioxide gas.

6. ACCIDENTAL LEAKAGE MEASURES

When pellets were spilled on the road or floor, wipe them off with a broom or cleaner. Handle the spillage in accordance with provisions given in the “Resin pellet spillage preventive manual”, in order to prevent intakes by marine animals and birds.

7. HANDLING AND STORAGE

HANDLING:

- 1) LCP resin in a pellet form will neither ignite nor explode at room temperatures.
- 2) LCP resin pellets spilled on the floor are likely to cause slipping.
Remove such spillage at any times.
- 3) For molding work, effective means for local exhaust are required to discharge gases generated by melt processing.
- 4) Avoid inhaling of gases generated in moulding work..
Do not directly touch resin of high temperature.
- 5) Avoid retaining hot resin in the processing machines for many hours.
- 6) Glass fibers are not generally exposed in a single substance under normal processing and handling conditions as they are compounded in pellets. However, the following measures will be necessary to minimize the exposure to glass fibers or dusts containing glass fibers, when pellets or molded parts containing glass fibers are cut, ground or burnt, depending on environmental and operational conditions.

Handling

- Those who are sensitive in skin to glass fiber should wear suitable (protective) clothes to minimize the exposure of their skin.
- Wash working clothes apart from other laundry. So that the latter will not cause contamination glass fibers.
- provide the workshop with partition to prevent diffusion of glass fiber dusts.

- pay precautions not to rub face ,neck or arms with hands, wash hands and gargle after working without fall.
- keep dust sources totally enclosed.
- provide local air exhausters, and implement periodical inspections and adjustments at least once a year.
- Reduce cutting and grinding processes to the possible minimum, and devise working procedures to minimize dust generation.
- provide dust-preventive masks, protective glasses and gloves for personal hygiene.
- Determine the operational environment at indoor working places and confirm the effects of environmental improvement.

Notice:

Glass fibers are, like road dusts told to be least hazardous to human bodies, but proper measures are required to avoid useless inhaling.

STORAGE:

- 1) Keep the substance away from any fire or heat sources for the sake of safe storage.
- 2) LCP resin should be handled in accordance with municipal rules and regulations.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONTROL CONCENTRION :None at present

PERMISSIBLE EXPOSURE CONCNTRATION:

OSHA PEL (nuisance/inert dust)

total	15 mg/m ³
respirable	5 mg/m ³

ACGIH TLV (nuisance particulates)

total	10 mg/m ³
respirable	3 mg/m ³

ENGINEERING MEASURES

When handing dust: Use totally enclosed containers resisting dust explosion.

When heat melted in molding: Effective local ventilation must be provided.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION :Wear a dust-proof mask.

EYE PROTECTION :Wear protective glassed or goggles.

HAND PROTECTION :Wear heat-resisting gloves against burns,
When handing molten polymer.

SKIN&BODY PROTECTION :wear long sleeve clothes against burns when
handling molten polymer.

9. PHYSICAL AND CHEMICAL PROPRITIES

APPEARANCE :Pellet

DENSITY :1.6 g/cm³

BOILING POINT :Not applicable

MELTING POINT :335 °C-345 °C

VAPOR PRESSURE	:Not applicable
VOLATILITY	:Not applicable
SUBLIMATION	:None
SOLUBILITY IN WATER	:Insoluble

10. PHYSICAL HAZARD (STABILITY AND REACTIVITY)

FLASH POINT	
IGNITION POINT	:540 °C or higher
DUST EXPLOSIVENESS	
UPPER EXPLOSION LIMIT	:Not applicable
LOWER EXPLOSION LIMIT	:35 g/cm ³
INFLAMMABILITY	:Self-extinguishing
SPONTANEOUS COMBUSTIBILITY	:None
REACTIVITY WITH WATER	:None
OXIDIZABILITY	:None
SELF-REACTIVITY	:None
STABILITY	:Stable for normal storage or handling
OTHERS	:Note

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (INCLUDING LD ₅₀)	:No finding.
SUBACUTE TOXICITY	:No finding.
CHRONIC TOXICITY	:No finding.
SKIN CORROSIVE PROPERTIES	:No finding.
SENSITIZING & IRRITANT EFFECTS	:Gas generated in drying or melting is irritating eyes and skins.
CARCINOGENICITY	:No finding.
MUTAGENICITY (Micro organisms, chromosomal aberration)	:No finding.
REPRODUCTIVE TOXICITY	:No finding.
TERATOGENICITY	:No finding.
OTHERS (Including generation of hazardous gases by reaction with water, for example)	:No finding.

(Remarks) "No finding" in this report means that there will be no hazard in general, but no proving data is available at the time of reporting.

➤ Effects on Human Bodies

(1) Effects on the skin

Stimulation to the skin with glass fibers may be caused when glass fibers diameter is larger than 4.5~5µm. They give mechanical stimulation followed by itchiness to the skin, but further continuous exposure reportedly results in extinction of stimulation. It may sometimes leads to irritable dermatitis complicated with urticaria or eczema-like reaction. It is, however reported that such dermatitis is not so serious in general and does not last too long. Therefore, skin stimulation can be prevented by proper use of glass fibers.

(2) Effects on Tumor

Investigations made on glass fibers till today reveal that there is neither Increase in mortality

of glass fiber production worker due to lung cancer or mesothelioma nor such cases reported.

➤ **Animal Test Report**

It is suggested that carcinogenicity of mineral fibers is dependent on their shapes rather than on their constituents. According to a report on experiments using 17 kinds of artificial mineral fibers in various sizes prepared by Dr Stanton of National Cancer Institute, in USA, statistical studies on correlations between the diameter and length of fibers and the coincidence of mesothelioma have revealed that mineral fibers having a diameter smaller than $0.25\mu\text{m}$ and a length larger than $8\mu\text{m}$ are closely related to the coincidence of cancers. Since these experiments were performed by artificially dosing the subject animals with a large quantity of glass fibers and consequently they are quite different from the actual exposures to human bodies, it is told to be problematic to make a conclusion that mineral fibers are hazardous to human health, basing on the results obtained from these experiments. Up to the present time, there is no result obtainable to demonstrate a mechanism of glass fibers causing lung cancers in spite of experiment by long exposure to glass fibers with high concentration.

12. ECOLOGICAL INFORMATION

BIODEGRADABILITY	:No finding.
BIOACCUMULATION	:No finding.
FISH TOXICITY	:No finding.

13. DISPOSAL CONSIDERATION

- 1) This is designated as waste as waste plastics among industrial by the Wastes Disposal Law. Dispose waste through licensed wastes handlers or local autonomous bodies if they are handling wastes disposal.
- 2) When disposed by incineration, use the well controlled incinerators in accordance with the Wastes Disposal Law, Air Pollution Control Law and Water Pollution Prevention Law.

14. TRANSPORT CONSIDERATION

- 1) Handle with care so as not to give damages to not to be subjected to wetting.
- 2) Secure the containers firmly so as not to cause collapsing.

15. REGULATORY INFORMATION

Wastes Disposal Law designates it as waste plastics among industrial wastes.

16. OTHER INFORMATION

HANDLING OF THE DETAILS GIVEN ABOVE:

This MSDS is the English version.

Details given above are based on references, information and data available at this moment, but no warranty can be made on exactness of these details. They are also prepared on the assumption that the product will be handled in a normal way. For special handling, adequate safety and environmental measures should be taken in respect to its applications. Our products are not specifically intended for implants for medical and dental applications, and therefore they are not recommended for such applications. Please contact Quality Assurance Department of Jiangmen

Dezhongtai (DZT) Engineering Plastics Tech. Co., Ltd. for further information.

DEPARTMENT ISSUING MSDS: DZT ENGINEERING PLASTICS TECH. CO., LTD

TEL: +86-750-3689707, +86-750-3689708



DZT Engineering Plastics Tech. Co.,Ltd Original Files

MATERIAL SAFETY DATA SHEET (MSDS)

Production:	LCP D-301F	Page of 1 - 6
MSDS NO.: 110302	Version 1.0	Revision Date: 2011/08/08

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

CHEMICAL PRODUCT NAME : LCP D-301F

NAME OF COMPANY : DZT Engineering Plastics Tech. Co.,Ltd

ADDRESS : Building 2 Zhichong Industrial Park, Hi-Tech Zone,
Jiangmen City, Guangdong Province, China

SECTION IN CHARGE : Quality Assurance Department

TEL/FAX : +86-750-3689920/+86-750-3689921

EMERGENCY TEL : +86-750-3689705

2. COMPOSITION/INFORMATION ON INGREDIENTS

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SYNONYM(S) : Aromatic Liquid Crystal Polymer(LCP)

CAS REGISTRY NUMBER : Not open

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UN CLASS : Not applicable

UN NUMBER : Not applicable

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CLASS OF HAZARDOUS CHEMICALS FOR MSDS IN CHINA: Not applicable

PHYSICAL AND CHEMICAL HAZARDS: Neither dangerous reaction nor explosion can be caused under normal conditions.

4. FIRST-AID MEASURES

➤ EYE CONTACT

Cool and rinse the eye with clean water for at least 15 minutes when the eyes had contact with molten polymer.

In case of wearing contact lenses, remove the lenses as soon as possible, and ask a physician for advice.

When the eye had contact with the polymer in an ordinary solid form, rinse the eye with clean water without delay.

If the discomfort persists, ask a physician for advice.

➤ SKIN CONTACT

Cool the contacted skin with clean water without delay, if a contact with the polymer in a molten form. Do not remove the solid resin on the skin.

➤ INHALATION

When a gas generated from the molten polymer has been inhaled, remove fresh air without delay and wait until the victim is recovered.

If sick feeling continues, ask a physician for advice.

➤ **INGESTION**

Help to vomit as much as possible .If sick feeling continues, and ask a physician for advice.

5. FIRE-FIGHTING MEASURES

➤ **FIRE-EXTINGUISHING MEASURES:**

Extinguish the fire with water. A method of extinguishing an ordinary fire may be applied.

Caution:

- 1) Incomplete combustion leads to generation of toxic gases such as carbon monoxide, in addition to carbonic acid gas and water.
- 2) In case the fire gained force, use a gas mask or other protective equipment.
- 3) Do not apply water directly to processing machines.

➤ **FIRE- EXTINGUISHING AGENTS:**

Water, foam fire-extinguishing agent, powder fire-extinguishing agent, and carbon dioxide gas.

6. ACCIDENTAL LEAKAGE MEASURES

When pellets were spilled on the road or floor, wipe them off with a broom or cleaner. Handle the spillage in accordance with provisions given in the “Resin pellet spillage preventive manual”, in order to prevent intakes by marine animals and birds.

7. HANDLING AND STORAGE

HANDLING:

- 1) LCP resin in a pellet form will neither ignite nor explode at room temperatures.
- 2) LCP resin pellets spilled on the floor are likely to cause slipping.
Remove such spillage at any times.
- 3) For molding work, effective means for local exhaust are required to discharge gases generated by melt processing.
- 4) Avoid inhaling of gases generated in moulding work..
Do not directly touch resin of high temperature.
- 5) Avoid retaining hot resin in the processing machines for many hours.
- 6) Glass fibers are not generally exposed in a single substance under normal processing and handling conditions as they are compounded in pellets. However, the following measures will be necessary to minimize the exposure to glass fibers or dusts containing glass fibers, when pellets or molded parts containing glass fibers are cut, ground or burnt, depending on environmental and operational conditions.

Handling

- Those who are sensitive in skin to glass fiber should wear suitable (protective) clothes to minimize the exposure of their skin.
- Wash working clothes apart from other laundry. So that the latter will not cause contamination glass fibers.
- provide the workshop with partition to prevent diffusion of glass fiber dusts.

- pay precautions not to rub face ,neck or arms with hands, wash hands and gargle after working without fall.
- keep dust sources totally enclosed.
- provide local air exhausters, and implement periodical inspections and adjustments at least once a year.
- Reduce cutting and grinding processes to the possible minimum, and devise working procedures to minimize dust generation.
- provide dust-preventive masks, protective glasses and gloves for personal hygiene.
- Determine the operational environment at indoor working places and confirm the effects of environmental improvement.

Notice:

Glass fibers are, like road dusts told to be least hazardous to human bodies, but proper measures are required to avoid useless inhaling.

STORAGE:

- 1) Keep the substance away from any fire or heat sources for the sake of safe storage.
- 2) LCP resin should be handled in accordance with municipal rules and regulations.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONTROL CONCENTRION :None at present

PERMISSIBLE EXPOSURE CONCNRATION:

OSHA PEL (nuisance/inert dust)

total	15 mg/m ³
respirable	5 mg/m ³

ACGIH TLV (nuisance particulates)

total	10 mg/m ³
respirable	3 mg/m ³

ENGINEERING MEASURES

When handing dust: Use totally enclosed containers resisting dust explosion.

When heat melted in molding: Effective local ventilation must be provided.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTION :Wear a dust-proof mask.

EYE PROTECTION :Wear protective glassed or goggles.

HAND PROTECTION :Wear heat-resisting gloves against burns,
When handing molten polymer.

SKIN&BODY PROTECTION :wear long sleeve clothes against burns when
handling molten polymer.

9. PHYSICAL AND CHEMICAL PROPRTIES

APPEARANCE :Pellet

DENSITY :1.6 g/cm³

BOILING POINT :Not applicable

MELTING POINT :310 °C-330 °C

VAPOR PRESSURE	:Not applicable
VOLATILITY	:Not applicable
SUBLIMATION	:None
SOLUBILITY IN WATER	:Insoluble

10. PHYSICAL HAZARD (STABILITY AND REACTIVITY)

FLASH POINT	
IGNITION POINT	:540 °C or higher
DUST EXPLOSIVENESS	
UPPER EXPLOSION LIMIT	:Not applicable
LOWER EXPLOSION LIMIT	:35 g/cm ³
INFLAMMABILITY	:Self-extinguishing
SPONTANEOUS COMBUSTIBILITY	:None
REACTIVITY WITH WATER	:None
OXIDIZABILITY	:None
SELF-REACTIVITY	:None
STABILITY	:Stable for normal storage or handling
OTHERS	:Note

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (INCLUDING LD ₅₀)	:No finding.
SUBACUTE TOXICITY	:No finding.
CHRONIC TOXICITY	:No finding.
SKIN CORROSIVE PROPERTIES	:No finding.
SENSITIZING & IRRITANT EFFECTS	:Gas generated in drying or melting is irritating eyes and skins.
CARCINOGENICITY	:No finding.
MUTAGENICITY (Micro organisms, chromosomal aberration)	:No finding.
REPRODUCTIVE TOXICITY	:No finding.
TERATOGENICITY	:No finding.
OTHERS (Including generation of hazardous gases by reaction with water, for example)	:No finding.

(Remarks) "No finding" in this report means that there will be no hazard in general, but no proving data is available at the time of reporting.

➤ Effects on Human Bodies

(1) Effects on the skin

Stimulation to the skin with glass fibers may be caused when glass fibers diameter is larger than 4.5~5µm. They give mechanical stimulation followed by itchiness to the skin, but further continuous exposure reportedly results in extinction of stimulation. It may sometimes leads to irritable dermatitis complicated with urticaria or eczema-like reaction. It is, however reported that such dermatitis is not so serious in general and does not last too long. Therefore, skin stimulation can be prevented by proper use of glass fibers.

(2) Effects on Tumor

Investigations made on glass fibers till today reveal that there is neither Increase in mortality

of glass fiber production worker due to lung cancer or mesothelioma nor such cases reported.

➤ **Animal Test Report**

It is suggested that carcinogenicity of mineral fibers is dependent on their shapes rather than on their constituents. According to a report on experiments using 17 kinds of artificial mineral fibers in various sizes prepared by Dr Stanton of National Cancer Institute, in USA, statistical studies on correlations between the diameter and length of fibers and the coincidence of mesothelioma have revealed that mineral fibers having a diameter smaller than $0.25\mu\text{m}$ and a length larger than $8\mu\text{m}$ are closely related to the coincidence of cancers. Since these experiments were performed by artificially dosing the subject animals with a large quantity of glass fibers and consequently they are quite different from the actual exposures to human bodies, it is told to be problematic to make a conclusion that mineral fibers are hazardous to human health, basing on the results obtained from these experiments. Up to the present time, there is no result obtainable to demonstrate a mechanism of glass fibers causing lung cancers in spite of experiment by long exposure to glass fibers with high concentration.

12. ECOLOGICAL INFORMATION

BIODEGRADABILITY	:No finding.
BIOACCUMULATION	:No finding.
FISH TOXICITY	:No finding.

13. DISPOSAL CONSIDERATION

- 1) This is designated as waste as waste plastics among industrial by the Wastes Disposal Law. Dispose waste through licensed wastes handlers or local autonomous bodies if they are handling wastes disposal.
- 2) When disposed by incineration, use the well controlled incinerators in accordance with the Wastes Disposal Law, Air Pollution Control Law and Water Pollution Prevention Law.

14. TRANSPORT CONSIDERATION

- 1) Handle with care so as not to give damages to not to be subjected to wetting.
- 2) Secure the containers firmly so as not to cause collapsing.

15. REGULATORY INFORMATION

Wastes Disposal Law designates it as waste plastics among industrial wastes.

16. OTHER INFORMATION

HANDLING OF THE DETAILS GIVEN ABOVE:

This MSDS is the English version.

Details given above are based on references, information and data available at this moment, but no warranty can be made on exactness of these details. They are also prepared on the assumption that the product will be handled in a normal way. For special handling, adequate safety and environmental measures should be taken in respect to its applications. Our products are not specifically intended for implants for medical and dental applications, and therefore they are not recommended for such applications. Please contact Quality Assurance Department of Jiangmen

Dezhongtai (DZT) Engineering Plastics Tech. Co., Ltd. for further information.

DEPARTMENT ISSUING MSDS: DZT ENGINEERING PLASTICS TECH. CO., LTD

TEL: +86-750-3689707, +86-750-3689708



DZT Engineering Plastics Tech. Co.,Ltd Original Files

物质安全资料

一. 物质标识

名称：雾锡药水

制造商或供应商名称：远方电子电镀有限公司

制造商或供应商电话0577-57123978传真：0577-62359000

二. 主要成分

主要成分	化学式	含量(%)	化学文摘社登记 号码 CAS. NO
有机酸，锡，雾锡添加剂		50-60%	

三. 健康危害

眼睛：有刺激性，严重使视力减弱

皮肤：有刺激性

吸入：呼吸困难

四. 急救措施

皮肤接触：以肥皂与清水清洗，并去除衣物，送医急救

吸入：将患者移至新鲜空气处，并送医急救

眼睛接触：立即以大量清水冲洗眼睛并送医急救

食入：服用大量清水，并催吐使之吐出，并送医急救

五. 火灾及爆炸危害资料

燃烧性：不燃

闪点：无意义

灭火方法：二氧化碳、粉末灭火器，灭火时中能因热产生之毒性蒸气，消防人员需配戴呼吸罩

六. 泄露之紧急应变

个人注意事项：避免倾倒

环境：需良好之通风设备

清理方法：需经废水处理

七. 处理与储存注意事项

处置：避免接触、摄取、吸入；操作时请穿戴个人防护配备

储存：于阴凉、干燥、通风处与具抗酸地板之场所，温度：25±5℃，湿度：80%以下

八. 暴露预防措施

个人防护设备：穿着个人防护配备

呼吸系统防护：活性碳口罩

眼睛防护：防溅之化学安全护目镜、安全罩，不要戴隐形眼镜

身体防护：防护衣

手防护：戴橡胶耐酸碱手套。

淋浴站及可用之冲洗设备

九. 物理和化学性质

物质状态：无色液体

熔点(℃)：

沸点(℃)：100℃

相对密度：1.2-1.5

PH值：0.5-1.8

十. 稳定性和反应特性

稳定性：稳定

聚合危害：

避免接触的条件：禁忌物：强碱材料

燃烧（分解）产物：碳氧化物				
十一. 毒性资料				
容许浓度			LD50	LC50
八小时日时量平均容许浓度TWA	短时间时量平均容许浓度STEL	最高容许浓度CEILING	测试动物吸收途径	测试动物吸收途径
200ppm	200	200ppm	NA	NA
十二. 环境生态资料				
无资料				
十三. 废弃处理与处置				
遵循当地政府及在方之环保规定处理				
十四. 运送资料				
联合国编号： 危害性分类： 所需图式种类（Hazard labels）：				
十五. 适用法规				
化学危险物品安全管理条例，化学危险物品安全管理条例实施细则，工作场所安全使用化学品规定等法规				
十六. 其它资料				
参考文献： 1. Aldrich Sigma RDH Fluka MSDS英文版 2. Mallinckrodt Baker MSDS英文版 制表者单位： 名称：远方电子电镀有限公司 地址：乐清市虹桥镇东工业区幸福东路1002号				



伦敦注册
REGISTERED IN LME

中国 云南锡业股份有限公司产品质量证明书

YUNNAN TIN COMPANY LTD OF P. R. CHINA

CERTIFICATE OF QUALITY



注册号 530950347
有效期 2005 年 12 月至 2008 年 12 月
通过 ISO9001:2000 质量管理体系认证
ISO9001:2000 Quality Management System Approved
通过 ISO14001:2004 环境管理体系认证
ISO14001:2004 Environmental Management System Approved

产品名称: 高纯锡
PRODUCT DESCRIPTION: High pure tin

牌 号:
CODE NO: Sn99.99

生产批号:
BATCH NO: 2008-095

执行标准: GB/T 728-1998
CHINESE STANDARD:

证书编号: 2008-715
CERTIFICATE NO:

发证日期: 2008.11.12
DATE ISSUED:

化学成份 (%) Chemical Composition	Sn	Pb	As	Fe	Cu	Bi	Sb	Zn	Al	Cd
实测值 Actual Measured Value	99.992	0.0026	0.0002	0.0005	0.0002	0.0021	0.0009	0.0001	0.0001	0.0001
标准值 Standard Value	99.99	0.0035	0.0005	0.0025	0.0005	0.0025	0.002	0.0005	0.0005	0.0003

检验员:
Inspector:

生产厂: 云南锡业股份有限公司冶炼分公司
Manufactured by: Smelting Branch of Yunnan Tin Company Limited
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检验机构:
Inspection Authority: