

承 認 書  
SPECIFICATION FOR APPROVAL

客 戶  
CUSTOMER

中磊電子股份有限公司

日 期  
DATE

2006/5/12

品 名  
DESCRIPTION

WSL002 RG-178 Flying Lead 1/4  $\lambda$   
Dipole Antenna With L44 (white)

客 戶 料 號  
CUSTOMER P/N

61720085WS

成 品 編 號  
Part NO.

TWW1593A1



萬旭電業股份有限公司

WANSHIH ELECTRONIC CO., LTD.

台北縣五股鄉五工六路 72 號 3 樓

3F 72 WU KONG 6TH RD., WU KU INDUSTRIAL DISTRICT

TAIPEI HSIEN, TAIWAN, R.O.C.

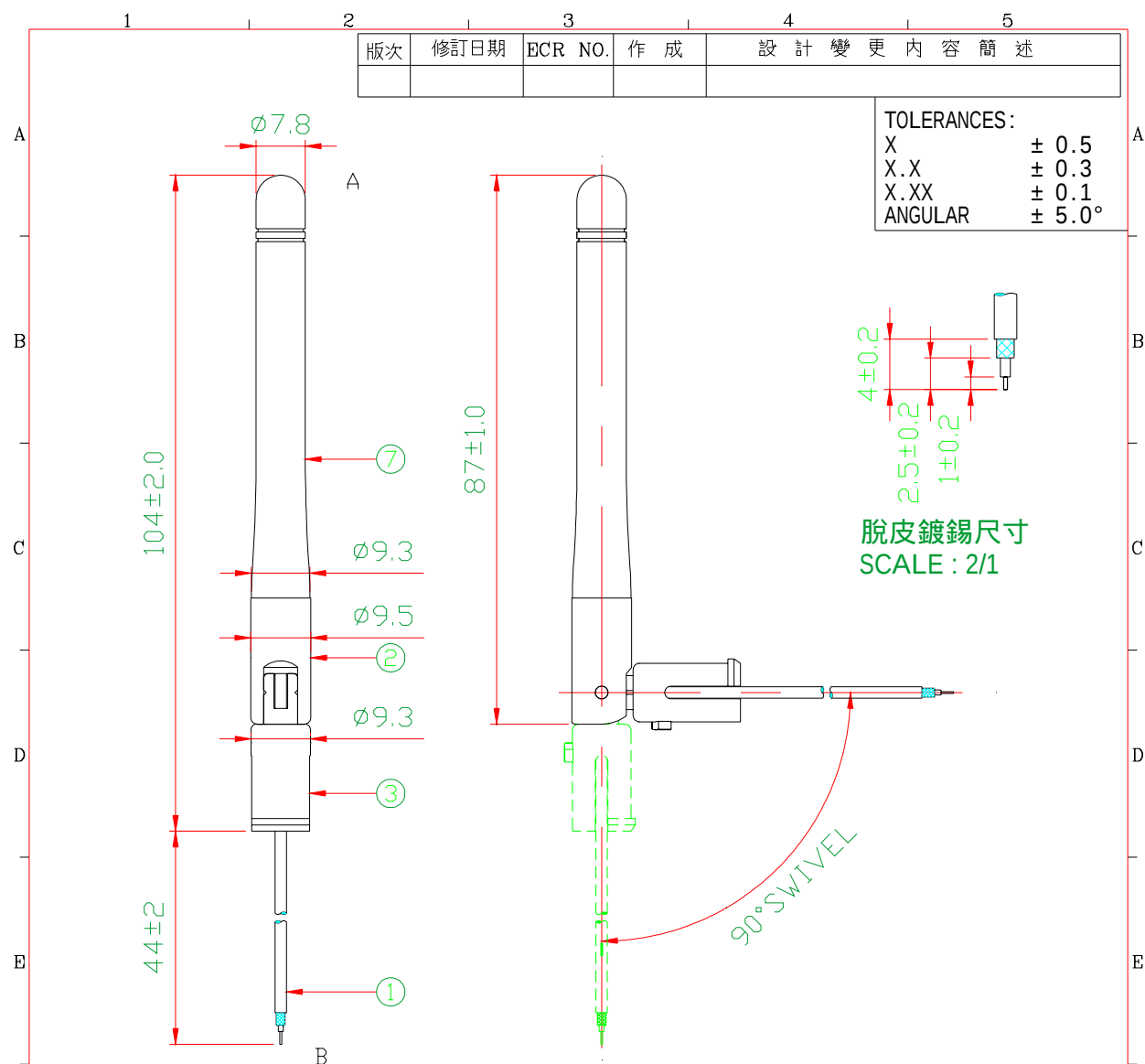
TEL : (02) 22988066 (5 LINE) FAX : (02)22981102

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# SPECIFICATION

- |                               |                                                |
|-------------------------------|------------------------------------------------|
| 1. Description                | : 2.4 GHz Flying Lead , 1/4λ<br>Dipole Antenna |
| 2. Customer                   | : 中磊電子股份有限公司                                   |
| 3. Model No.                  | : WSL002                                       |
| 4. Part No.                   | : TTWW1593A1                                   |
| 5. Standard                   | : IEEE 802.11 b/g Wireless LAN                 |
| 6. Antenna Profile            | : 44 mm (see Drawing)                          |
| 7. Color                      | : white (DuPont LS033)                         |
| 8. Electrical Characteristics |                                                |
| Operating Frequency           | : 2.4~2.5GHz                                   |
| Antenna Type                  | : 1/4λ Dipole Sleeve                           |
| Polarization Type             | : Linear                                       |
| Type of Radiation             | : Toroidal                                     |
| Peak Gain                     | : 2.0 dBi Typical                              |
| Impedance                     | : 50 Ohm nominal                               |
| V.S.W.R.                      | : 2.0:1 Max.                                   |
| 9. Mechanical Characteristics |                                                |
| Connector                     | : N/A                                          |
| Core                          | : N/A                                          |
| 10. Raw Material              |                                                |
| Coaxial Cable                 | : RG-178                                       |
| Housing                       | : TPE                                          |
| Hinge                         | : PC+ALLOY                                     |



作業說明：

1.天線本體，WSW0011A WFL 2dBi天線作業標準指導書規定製作。  
依據 AQ-0011A QC管理工程圖，執行品質管制。

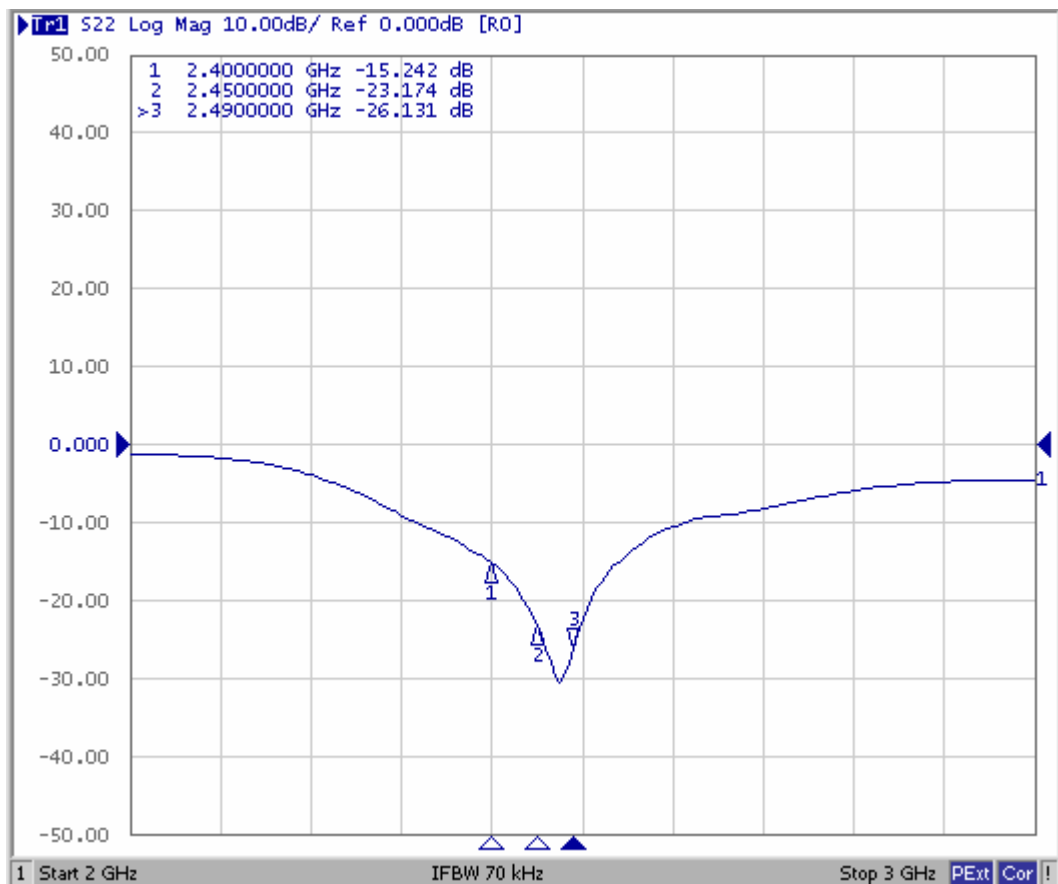
|    |                      |    |                |                                       |    |      |        |
|----|----------------------|----|----------------|---------------------------------------|----|------|--------|
| 7  | 外套<白>                | v  | B093750L6790TM | @9.3 φ *75L(67L) 外套白<DuPont LS033>TPE | 白  | 1    | 或同級品   |
| 6  | 銅管連接軸                | v  | B265L7402000TM | @6.5 φ *7.4L For WSL005用銅管連接軸         | 黑  | 1    | 或同級品   |
| 5  | 銅管                   | v  | B0520220L25TWQ | @5.2 φ *22.0L*0.25t 銅管                | 銀  | 1    | 或同級品   |
| 4  | 固定鉚釘(亮鍍)             | !  | B02892200180ME | 028922001-8 3.80*1.90 φ 固定鉚釘(小)(亮鍍)   | 銀  | 2    | 或同級品   |
| 3  | 下座白                  | v  | B093247LLS03WT | @9.3 φ *24.7L 下座白< DuPont LS033 >     | 白  | 1    | 或同級品   |
| 2  | 上座白                  | v  | B093200LLS03WT | @9.5 φ *20.0L上座白< DuPont LS033>       | 白  | 1    | 或同級品   |
| 1  | RG-178 Coaxial Cable | v  | 19RG17800030AE | @RG-178 CABLE 105SV(萬泰)               | 橙  | 125  | 1 或同級品 |
| NO | 材料名稱                 | 環材 | 電腦編號           | 零件規格                                  | 顏色 | 切斷尺寸 | 用量 備註  |

|         |      |                 |     |                                                                                |                    |
|---------|------|-----------------|-----|--------------------------------------------------------------------------------|--------------------|
| 修訂日期：   |      | 制訂日期：2006/05/11 |     | 承認圖號                                                                           |                    |
| 頁數：1/1  | 核 准  | 審 查             | 作 成 | 品 名                                                                            |                    |
| 第三角法    | Ryan | Lingo           | 郭雅珍 | RG-178 Flying Lead , SWIVEL TYPE ,<br>1/4 λ Dipole Antenna L44mm(Dupont LS033) |                    |
| 單位：mm   |      |                 |     | 成品編號                                                                           |                    |
| 比例：FREE |      |                 |     | TWW1593                                                                        | REV A<br>VERSION 1 |

萬旭電業股份有限公司 [53] 文件編號：FMT-0513-D7

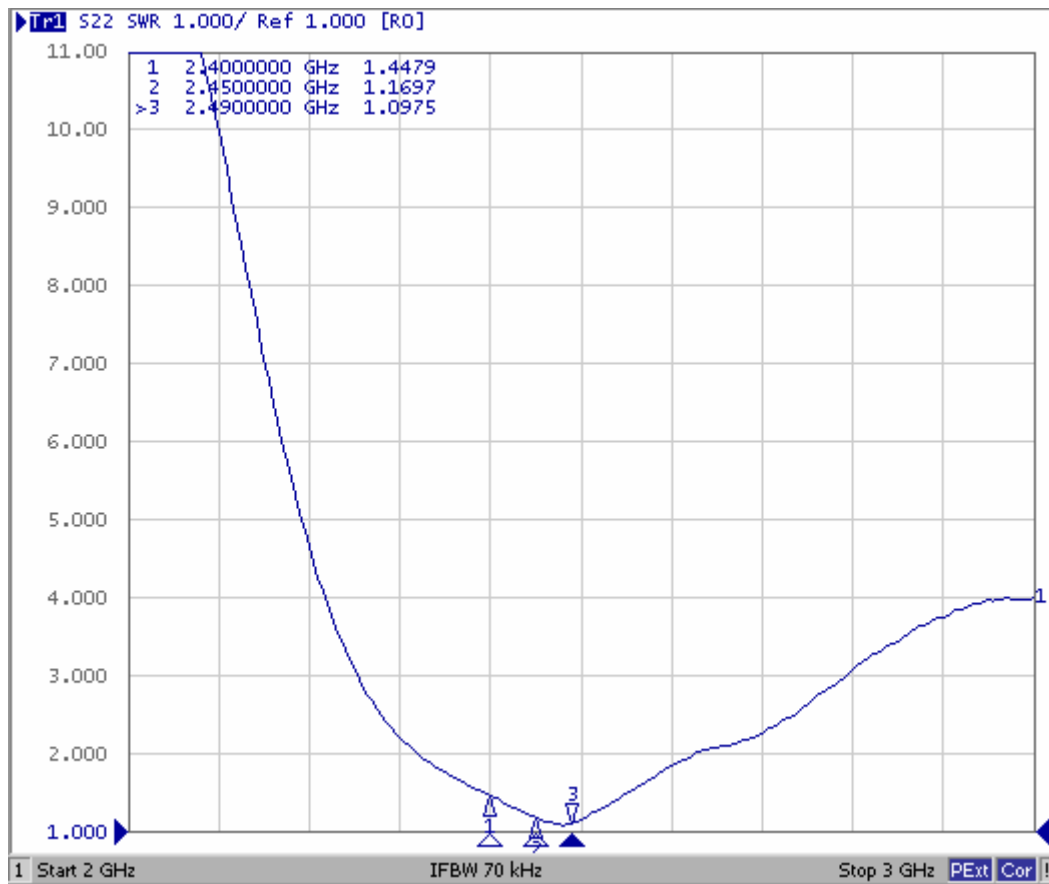
# Electrical Properties

## Return Loss (Test on board)



# Electrical Properties

## V.S.W.R (Test on board)



# Electrical Properties

## Radiation Pattern – H Plane

(Test on board)

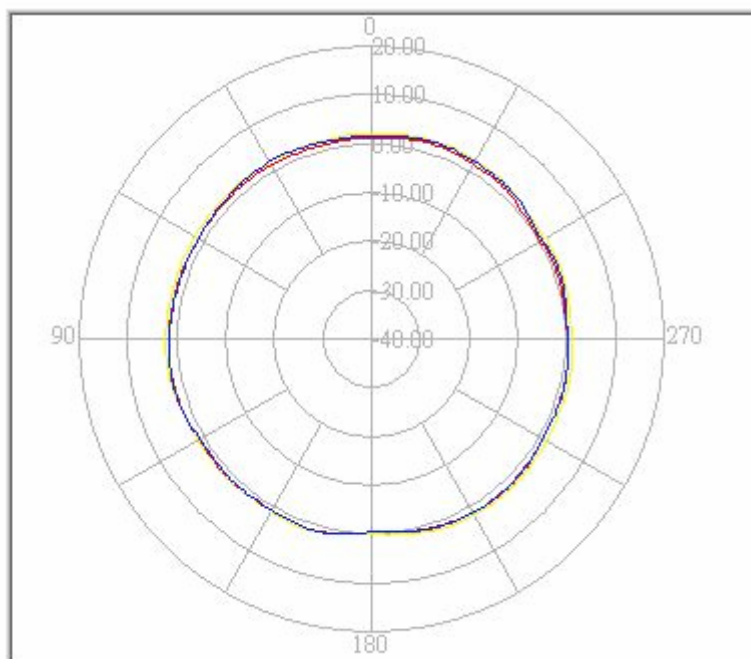


萬旭電業股份有限公司

**Model No:** cl-060427-FL

**Antenna Position:** Vertical

**Test Mode:** H-Plane



| Freq(MHz) | peak(dBi) | Angle(o) | Avg(dBi) |
|-----------|-----------|----------|----------|
| 2400.00   | 2.47      | 17.08    | 1.59     |
| Freq(MHz) | peak(dBi) | Angle(o) | Avg(dBi) |
| 2450.00   | 1.75      | 17.08    | 0.95     |
| Freq(MHz) | peak(dBi) | Angle(o) | Avg(dBi) |
| 2490.00   | 2.34      | 20.75    | 1.13     |

# Electrical Properties

## Radiation Pattern – E Plane

(Test on board)

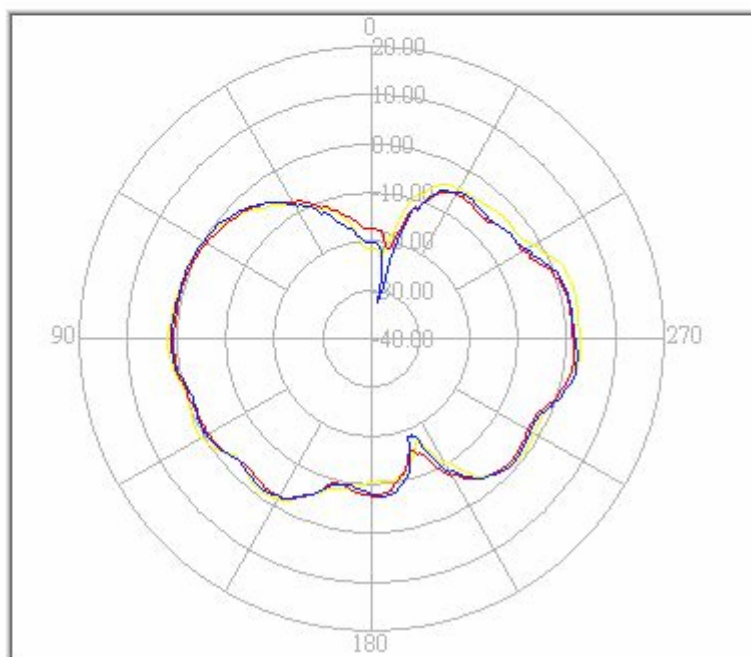


萬旭電業股份有限公司

**Model No:** c1-060427-FL

**Antenna Position:** Horizontal

**Test Mode:** E-Plane



| Freq(MHz) | peak(dBi) | Angle(o) | Avg(dBi) |
|-----------|-----------|----------|----------|
| 2400.00   | 2.86      | 94.86    | -1.79    |
| Freq(MHz) | peak(dBi) | Angle(o) | Avg(dBi) |
| 2450.00   | 1.72      | 96.08    | -2.75    |
| Freq(MHz) | peak(dBi) | Angle(o) | Avg(dBi) |
| 2490.00   | 2.45      | 98.51    | -2.38    |

# Material Data Sheet

## RG-178 Coaxial Cable

### SPECIFICATION FOR APPROVAL

DOCUMENT: A30178B001

---

STYLE : 105°C 30V  
RG-178B/U

---

SIZE: 7/0.102 SCCS

---

RECOGNIZED: UL 1979

---



WONDERFUL HI-TECH CO.,LTD

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WU KU IND. DISTRICT  
TAIPEI HSIEN,TAIWAN

TEL : (02)22988033  
FAX : (02)22988031-2

FACTORY : 17 PEI YUAN ROAD,  
CHUNG-LI IND. PARK  
TAIWAN, R.O.C.

TEL : (03)4527777  
FAX : (03)4517214



**WONDERFUL HI-TECH CO., LTD**  
**SPECIFICATION**

|                     |                                                                                     |                                         |
|---------------------|-------------------------------------------------------------------------------------|-----------------------------------------|
| STYLE               | 105°C 30V<br>UL1979                                                                 | DOCUMENT NO :<br>A30178B001             |
| SIZE                | RG-178B/U                                                                           | ESTABLISHED DATE:<br>2004/03/22         |
| STANDARD : MIL-C-17 |                                                                                     |                                         |
| Conductor           | Size                                                                                | AWG 30                                  |
|                     | Material                                                                            | ---- Silver-Coated Copper<br>Clad Steel |
|                     | Conductors No.                                                                      | ---- 7                                  |
|                     | Conductors Size                                                                     | mm 0.102                                |
|                     | O.D.                                                                                | mm 0.30                                 |
| Insulation          | Average Thickness                                                                   | mm 0.28                                 |
|                     | Diameter                                                                            | mm 0.86 ±0.03                           |
|                     | Material                                                                            | ---- FEP                                |
|                     | Color                                                                               | ---- Clear                              |
| Braid               | Material                                                                            | ---- Silver-Coated Copper               |
|                     | Construction                                                                        | mm 16 / 3 / 0.10                        |
|                     | Coverage                                                                            | % 95                                    |
| Jacket              | Average Thickness                                                                   | mm 0.25                                 |
|                     | Diameter                                                                            | mm 1.80 ±0.05                           |
|                     | Material                                                                            | ---- FEP                                |
|                     | Color                                                                               | ---- Brown                              |
| Marking             |                                                                                     |                                         |
| Drawing             |  |                                         |

AK001/210X297/1.0

PAGE : 1

EDITION : 1.2

MAKER : C.Y.CHEN

CONFIRM : S.N.WONG

APPROVAL : W.J.WANG



# WONDERFUL HI-TECH CO., LTD. SPECIFICATION

| Electrical & Physical Properties |        |                  |                                             |        |        |      |  |
|----------------------------------|--------|------------------|---------------------------------------------|--------|--------|------|--|
| Item                             |        |                  | RG-178B/U                                   |        |        |      |  |
| Rating Temp Voltage              |        |                  | 105°C 30V                                   |        |        |      |  |
| Conductor Resistance             |        |                  | 838 OHM/KM/20°C MAX.                        |        |        |      |  |
| Insulation Resistance            |        |                  | 3000 MEGA OHM/KM MIN.                       |        |        |      |  |
| Dielectric Strength              |        |                  | AC 500V/Minute                              |        |        |      |  |
| Spark Test                       |        |                  | 2.5 KV                                      |        |        |      |  |
| Insulation                       | Unaged | Tensile Strength | 2500 PSI MIN.( 1.76 Kg / m m <sup>2</sup> ) |        |        |      |  |
|                                  |        | Elongation       | 200% MIN.                                   |        |        |      |  |
|                                  | Aged   | Tensile Strength | UNAGED MIN 75%(168HRS×232°C)                |        |        |      |  |
|                                  |        | Elongation       | UNAGED MIN 75%(168HRS×232°C)                |        |        |      |  |
| Jacket                           | Unaged | Tensile Strength | 2500 PSI MIN.( 1.76 Kg / m m <sup>2</sup> ) |        |        |      |  |
|                                  |        | Elongation       | 200% MIN.                                   |        |        |      |  |
|                                  | Aged   | Tensile Strength | UNAGED MIN.75%(168HRS×232°C)                |        |        |      |  |
|                                  |        | Elongation       | UNAGED MIN.75%(168HRS×232°C)                |        |        |      |  |
| Nom. Impedance                   |        |                  | 50 Ohms                                     |        |        |      |  |
| Nom. Capacitance                 |        |                  | 95.8 pF/m                                   |        |        |      |  |
| Nom. Vel. of Prop.               |        |                  | 69.5%                                       |        |        |      |  |
| VSWR (0 – 6 GHZ)                 |        |                  | UNDER 1.3                                   |        |        |      |  |
| Attenuation (dB/100m)            | 100MHz | 1GHz             | 1.8GHz                                      | 2.4GHz | 5.2GHz | 6GHz |  |
|                                  | 46     | 155              | 295                                         | 340    | 505    | 550  |  |

AK001/210X297/1.0

PAGE : 2

EDITION : 1.2

MAKER : C.Y.CHEN

CONFIRM : S.N.WONG

APPROVAL : W.J.WANG



## Test Report

WONDERFUL HI-TECH CO., LTD.  
NO. 17, PEI-YUAN ROAD., CHUNG-LI IND. PARK,  
TAOYUAN TAIWAN, R. O. C.

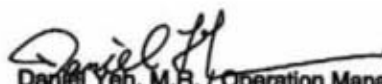
Report No. : CE/2004/C1637  
Date : 2004/12/16  
Page : 1 of 3

**The following merchandise was (were) submitted and identified by the client as :**

Type of Product : RG-178 B/U 36AWG SERIES  
Sample Received : 2004/12/09  
Testing Date : 2004/12/09 TO 2004/12/16

=====

**Test Result** : - Please see the next page -

  
Daniel Yeh, M.R. / Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.

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## Test Report

WONDERFUL HI-TECH CO., LTD.  
NO. 17, PEI-YUAN ROAD., CHUNG-LI IND. PARK,  
TAOYUAN TAIWAN, R. O. C.

Report No. : CE/2004/C1637  
Date : 2004/12/16  
Page : 2 of 3

### Test Result

PART NAME NO.1 : WHITE FEP JACKET(PLEASE REFER TO THE PHOTO ATTACHED)

| Test Item (s):                                     | Unit | Method                                                                                                                                                      | MDL    | Result |  |  |  |
|----------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|
|                                                    |      |                                                                                                                                                             |        | No.1   |  |  |  |
| PBBs(Polybrominated biphenyls)(CAS NO:059536-65-1) | %    | With reference to USEPA3540 or USEPA3550. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC) | 0.0005 | N.D.   |  |  |  |
| PBBEs(PBDEs)(Polybrominated biphenyl ethers)       | %    | With reference to USEPA3540 or USEPA3550. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC) | 0.0005 | N.D.   |  |  |  |

| Test Item (s):     | Unit | Method                                                               | MDL | Result |  |  |  |
|--------------------|------|----------------------------------------------------------------------|-----|--------|--|--|--|
|                    |      |                                                                      |     | No.1   |  |  |  |
| Chromium VI (Cr+6) | ppm  | As per US EPA 7196A and US EPA 3060A.                                | 2   | N.D.   |  |  |  |
| Cadmium (Cd)       | ppm  | ICP-AES after as per EN 1122, method B:2001 or other acid digestion. | 2   | N.D.   |  |  |  |
| Mercury (Hg)       | ppm  | ICP-AES after as per US EPA 3052 or other acid digestion.            | 2   | N.D.   |  |  |  |
| Lead (Pb)          | ppm  | ICP-AES after as per US EPA 3050B or other acid digestion.           | 2   | N.D.   |  |  |  |

NOTE• (1) N.D. = Not detected (<MDL)  
(2) ppm = mg/kg  
(3) MDL = Method Detection Limit

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## Test Report

WONDERFUL HI-TECH CO., LTD.  
NO. 17, PEI-YUAN ROAD., CHUNG-LI IND, PARK,  
TAOYUAN TAIWAN, R. O. C.

Report No. : CE/2004/C1637  
Date : 2004/12/16  
Page : 3 of 3



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SGS TAIWAN LIMITED

NO. 136-1, Wu Kung Road, Wuku Industrial Zone, Taipei county, Taiwan.  
(886-2) 22993939 / (886-2) 2299-3237 [www.sgs.com.tw](http://www.sgs.com.tw)

# Housing Material Data Sheet

- Housing(外套)- TPE

## KEYFLEX BT-1055D

Ester type TPE



| Item                              | Test method | Test Condition        | Unit                      | Value        |
|-----------------------------------|-------------|-----------------------|---------------------------|--------------|
| PHYSICAL                          |             |                       |                           |              |
| Specific Gravity                  | ASTM D297   | 23°C                  |                           | 1.19         |
| Melt Index                        | ASTM D1238  | 200°C/2.16kg          | g/10min                   | 28           |
| Density                           | ASTM D1505  | Density Gradient Tube | g/10min                   |              |
| Water Absorbance                  | ASTM D570   | 23°C                  | %                         | 0.5          |
| Mold Shrinkage                    | ASTM D955   |                       | %                         | 1.2          |
| MECHANICAL                        |             |                       |                           |              |
| Tensile Strain at Break           | ASTM D412   | 500mm/min             | kg/cm <sup>2</sup><br>MPa | 340<br>33.3  |
| Tensile Elongation                | ASTM D412   | 500mm/min             | %                         | 650          |
| Tensile Strength                  | ASTM D638   | 500mm/min             | kg/cm <sup>2</sup><br>MPa | 140<br>13.7  |
| 5% Tensile Stress                 | ASTM D638   | 500mm/min             | kg/cm <sup>2</sup><br>MPa | 65<br>6.4    |
| Flexural Modulus(Initial)         | ASTM D790   | 15mm/min              | kg/cm <sup>2</sup><br>MPa | 2,100<br>206 |
| Tear Strength                     | ASTM D624   | JIS B type            | kg/cm                     | 150          |
| Izod Impact Strength<br>(Notched) | ASTM D256   | 23°C                  | kg-cm/cm<br>J/m           | NB<br>NB     |
|                                   |             |                       |                           |              |
|                                   |             | -40 °C                | kg-cm/cm<br>J/m           | 20<br>NB     |
|                                   |             |                       |                           |              |
| Elongation                        | ASTM D395   |                       | %                         |              |
| Compression Set                   | ASTM D395   | 25°C x 22hr           | %                         |              |
|                                   |             | 70°C x 22hr           | %                         | 54           |
| Hardness                          | ASTM D2240  | shore A               |                           |              |
|                                   |             | shore D               |                           | 55           |

\*Note : 1)The values of properties in the above table have been obtained by the test pieces(natural color) manufactured under certain of injection.

2)The listed values should be used for referential purposed only.



## Test Report

WGJ COMPANY LTD.  
NO. 5, TING FU 5 TH STREET, KWEI SHAN HSIANG,  
TAOYUAN HSIEN, TAIWAN

Report No. : CE/2005/70439  
Date : 2005/07/11  
Page : 1 of 4

**The following merchandise was (were) submitted and identified by the client as :**

|                        |   |                          |
|------------------------|---|--------------------------|
| <u>Type of Product</u> | : | LG KEYFLEX TPEE          |
| <u>Style/Item No</u>   | : | BT1055DNC, BT1063DNC     |
| <u>Sample Received</u> | : | 2005/07/04               |
| <u>Testing Date</u>    | : | 2005/07/04 TO 2005/07/11 |

---

**Conclusion** : The test results of Pb, Cd, Hg, Cr+6, PBB and PBDE for the submitted sample comply with the requirements of RoHS (2002/95/EC).

  
Daniel Yeh, M.R. / Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.

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## Test Report

WGJ COMPANY LTD.  
NO. 5, TING FU 5 TH STREET, KWEI SHAN HSIANG,  
TAOYUAN HSIEN, TAIWAN

Report No. : CE/2005/70439

Date : 2005/07/11

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### Test Result

PART NAME NO.1 : WHITE PLASTIC PELLETS (PLEASE REFER TO THE PHOTO ATTACHED)

PASS

| Test Item (s):                                                         | Unit | Method                                                                                                                                                        | MDL    | Result | Limit of ROHS |
|------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|---------------|
|                                                                        |      |                                                                                                                                                               |        | No.1   |               |
| Monobromobiphenyl                                                      | %    | With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC) | 0.0005 | N.D.   | -             |
| Dibromobiphenyl                                                        | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Tribromobiphenyl                                                       | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Tetrabromobiphenyl                                                     | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Pentabromobiphenyl                                                     | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Hexabromobiphenyl                                                      | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Heptabromobiphenyl                                                     | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Octabromobiphenyl                                                      | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Nonabromobiphenyl                                                      | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Decabromobiphenyl                                                      | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| <b>Total PBBs (Polybrominated biphenyls)/Sum of above</b>              | %    |                                                                                                                                                               | -      | N.D.   | 0.1           |
| Monobromobiphenyl ether                                                | %    | With reference to USEPA3540C or USEPA3550C. Analysis was performed by HPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/264/EEC, and 76/769/EEC) | 0.0005 | N.D.   | -             |
| Dibromobiphenyl ether                                                  | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Tribromobiphenyl ether                                                 | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Tetrabromobiphenyl ether                                               | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Pentabromobiphenyl ether                                               | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Hexabromobiphenyl ether                                                | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Heptabromobiphenyl ether                                               | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Octabromobiphenyl ether                                                | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Nonabromobiphenyl ether                                                | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| Decabromobiphenyl ether                                                | %    |                                                                                                                                                               | 0.0005 | N.D.   | -             |
| <b>Total PBDEs(PBDEs)(Polybrominated biphenyl ethers)/Sum of above</b> | %    |                                                                                                                                                               | -      | N.D.   | 0.1           |

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8866-25 2299-1639 (8866-25) 2299-3237 www.sgs.com.tw



## Test Report

WGJ COMPANY LTD.  
NO. 5, TING FU 5 TH STREET, KWEI SHAN HSIANG,  
TAOYUAN HSIEN, TAIWAN

Report No. : CE/2005/70439  
Date : 2005/07/11  
Page : 3 of 4

PASS

| Test Item (s):     | Unit | Method                                                                           | MDL | Result | Limit of<br>ROHS |
|--------------------|------|----------------------------------------------------------------------------------|-----|--------|------------------|
|                    |      |                                                                                  |     | No.1   |                  |
| Chromium VI (Cr+6) | ppm  | UV-VIS after reference to<br>US EPA 3060A.                                       | 2   | N.D.   | 1000             |
| Cadmium (Cd)       | ppm  | ICP-AES after reference to<br>EN 1122, method B:2001<br>or other acid digestion. | 2   | N.D.   | 100              |
| Mercury (Hg)       | ppm  | ICP-AES after reference to<br>US EPA 3052 or other acid<br>digestion.            | 2   | N.D.   | 1000             |
| Lead (Pb)          | ppm  | ICP-AES after reference to<br>US EPA 3050B or other<br>acid digestion.           | 2   | N.D.   | 1000             |

NOTE: (1) N.D. = Not detected (<MDL)  
(2) ppm = mg/kg  
(3) MDL = Method Detection Limit  
(4) " - " = No Regulation

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## Test Report

WGJ COMPANY LTD.  
NO. 5, TING FU 5 TH STREET, KWEI SHAN HSIANG,  
TAOYUAN HSIEN, TAIWAN

Report No. : CE/2005/70439  
Date : 2005/07/11  
Page : 4 of 4



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• Hinge(上座/下座)- PC+ALLOY

|                                     |                                                                 |
|-------------------------------------|-----------------------------------------------------------------|
| <b>SHINBLEND<sup>®</sup></b>        | <b>SHINKONG SYNTHETIC FIBERS CORPORATION</b>                    |
| <b>ALLOY</b>                        | 新光合成纖維股份有限公司                                                    |
| <b>ENGINEERING PLASTIC DIVISION</b> | 8th Fl., 123, Sec.2, Nanking East Road, Taipei, Taiwan          |
|                                     | Tel: 886-2-2507-0131 886-2-2507-1234 30Lines 886-3-4932131-1780 |
|                                     | Fax: 886-2-2506-8047 886-3-491-5263                             |

Technical Data

|                              |       | SHINBLEND <sup>®</sup><br>A724NA |             |         |  |
|------------------------------|-------|----------------------------------|-------------|---------|--|
|                              |       | High Impact Grade / 超韌級 AD4011   |             |         |  |
|                              |       | Unit                             | Test Method | Values  |  |
| <b>Mechanical properties</b> |       | <b>機械性質</b>                      |             |         |  |
| Izod Impact(Notched) 23°C    | 衝擊強度  | Kg-cm/cm                         | ASTM D256   | 85      |  |
| -20°C                        | 衝擊強度  | Kg-cm/cm                         | ASTM D256   | 70      |  |
| -40°C                        | 衝擊強度  | Kg-cm/cm                         | ASTM D256   | 65      |  |
| Tensile Strength             | 拉伸強度  | Kg/cm <sup>2</sup>               | ASTM D638   | 540     |  |
| Elongation                   | 拉伸率   | %                                | ASTM D638   | 100     |  |
| Flexural Strength            | 彎曲強度  | Kg/cm <sup>2</sup>               | ASTM D790   | 800     |  |
| Flexural Modulus             | 彎曲模數  | Kg/cm <sup>2</sup>               | ASTM D790   | 20000   |  |
| <b>Thermal properties</b>    |       | <b>熱性質</b>                       |             |         |  |
| Heat Deflection Temperature  | 熱變形溫度 |                                  | ASTM D648   |         |  |
| 66psi                        |       | °C                               |             | -       |  |
| 264psi                       |       | °C                               |             | 100     |  |
| Flammability                 | 防火性   | -                                | UL94        | -       |  |
| Melting Point                | 熔點    | °C                               | DSC         | 223     |  |
| <b>Electrical properties</b> |       | <b>電氣性質</b>                      |             |         |  |
| Dielectric Strength          | 介電強度  | KV/MM                            | ASTM D149   | -       |  |
| Dielectric Constant          | 介電常數  | ...                              | ASTM D150   | -       |  |
| Volume Resistivity           | 體積電阻  | Ω-CM                             | ASTM D257   | -       |  |
| <b>Other properties</b>      |       | <b>其它性質</b>                      |             |         |  |
| Specific Gravity             | 比重    | -                                | ASTM D792   | 1.19    |  |
| Water Absorption             | 吸水率   | %                                | ASTM D570   | 0.14    |  |
| Mold Shrinkage               | 成形收縮率 |                                  | ASTM D955   |         |  |
| Flow                         | 流動方向  | %                                |             | 0.4~0.6 |  |
| Cross Flow                   | 垂直方向  | %                                |             | 0.5~0.7 |  |

"Nothing in this information shall be construed as a recommendation for any use that may infringe on any patent right or as an endorsement of any material supplied by Shinkong Synthetic Fibers Corporation. We do not guarantee the applicability or the accuracy of this information or the performance of our products in any specific situation. We recommend each user of our products make its own tests to determine if the material is suitable for a particular use. The data show here are within the normal range of product properties, but they are NOT SPECIFICATION LIMITS. Additives of any kind alter some or all of the properties."

2002/6



## Test Report

SHINKONG SYNTHETIC FIBERS CORPORATION  
8F., NO.123, SEC. 2, NANKING E. RD., TAIPEI, TAIWAN

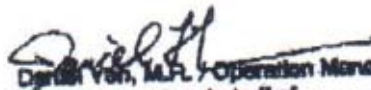
Report No. : CE/2006/13401  
Date : 2006/01/19  
Page : 1 of 5

The following merchandise was (were) submitted and identified by the client as :

|                     |   |                                       |
|---------------------|---|---------------------------------------|
| Type of Product     | : | THERMOPLASTIC POLYESTER RESIN         |
| Style/Item No       | : | A724NA                                |
| Manufacturer/Vendor | : | SHINKONG SYNTHETIC FIBERS CORPORATION |
| Sample Received     | : | 2006/01/12                            |
| Testing Date        | : | 2006/01/12 TO 2006/01/19              |

Test Result

: Please see the next page -

  
Daniel Yen, M.P., Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.

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## Test Report

SHINKONG SYNTHETIC FIBERS CORPORATION  
8F., NO.123, SEC. 2, NANKING E. RD., TAIPEI, TAIWAN

Report No. : CE/2006/13401  
Date : 2006/01/19  
Page : 2 of 5

### Test Result

PART NAME NO. 1

: WHITE PLASTIC PELLETS

| Test Item (s):                                                         | Unit | Method                                                                                                                                                                             | MDL    | Result<br>No. 1 |
|------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------|
| Monobromobiphenyl                                                      | %    | With reference to<br>USEPA3540C or<br>USEPA3550C. Analysis was<br>performed by HPLC/DAD,<br>LC/MS or GC/MS.<br>(prohibited by 2002/95/EC<br>(RoHS), 83/264/EEC, and<br>76/769/EEC) | 0.0005 | N.D.            |
| Dibromobiphenyl                                                        | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Tri bromobiphenyl                                                      | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Tetrabromobiphenyl                                                     | %    |                                                                                                                                                                                    | 0.0003 | N.D.            |
| Pentabromobiphenyl                                                     | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Hexabromobiphenyl                                                      | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Heptabromobiphenyl                                                     | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Octabromobiphenyl                                                      | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Nonabromobiphenyl                                                      | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Decabromobiphenyl                                                      | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Total PBBs<br>(Polybrominated<br>biphenyls)/Sum of above               | %    |                                                                                                                                                                                    |        |                 |
| Monobromobiphenyl ether                                                | %    | With reference to<br>USEPA3540C or<br>USEPA3550C. Analysis was<br>performed by HPLC/DAD,<br>LC/MS or GC/MS.<br>(prohibited by 2002/95/EC<br>(RoHS), 83/264/EEC, and<br>76/769/EEC) | 0.0005 | N.D.            |
| Dibromobiphenyl ether                                                  | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Tri bromobiphenyl ether                                                | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Tetrabromobiphenyl ether                                               | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Pentabromobiphenyl ether                                               | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Hexabromobiphenyl ether                                                | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Heptabromobiphenyl ether                                               | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Octabromobiphenyl ether                                                | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Nonabromobiphenyl ether                                                | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Decabromobiphenyl ether                                                | %    |                                                                                                                                                                                    | 0.0005 | N.D.            |
| Total PBDEs(PBDEs)<br>(Polybrominated biphenyl<br>ethers)/Sum of above | %    |                                                                                                                                                                                    |        |                 |
| Total of Mono to Nona-<br>brominated biphenyl<br>ether. (Note 4)       | %    |                                                                                                                                                                                    |        | N.D.            |

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## Test Report

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8F., NO.123, SEC. 2, NANKING E. RD., TAIPEI, TAIWAN

Report No. : CE/2006/13401  
Date : 2006/01/19  
Page : 3 of 5

| Test Item (s):     | Unit | Method                                                          | MDL | Result |
|--------------------|------|-----------------------------------------------------------------|-----|--------|
|                    |      |                                                                 |     | No.1   |
| Chromium VI (Cr+6) | ppm  | UV-VIS after reference to US EPA 3060A.                         | 2   | N.D.   |
| Cadmium (Cd)       | ppm  | ICP-AES after reference to US EPA 3052 or other acid digestion. | 2   | N.D.   |
| Mercury (Hg)       | ppm  | ICP-AES after reference to US EPA 3052 or other acid digestion. | 2   | N.D.   |
| Lead (Pb)          | ppm  | ICP-AES after reference to US EPA 3052 or other acid digestion. | 2   | N.D.   |

- NOTE: (1) N.D. = Not detected (<MDL)  
(2) ppm = mg/kg  
(3) MDL = Method Detection Limit  
(4) Decabromodiphenyl ether (DecaBDE) in polymeric applications is exempted by Commission Decision of 13 Oct 2005 amending Directive 2002/95/EC notified under document 2005/717/EC.  
(5) PBBEs=PBDEs=Polybrominated Diphenyl Ethers=PBDOs=PBBOs.  
(6) " - " = Not Regulation

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13/02/2006 13:11 FAX 00  
17 08 2011 15:11 FAX 00

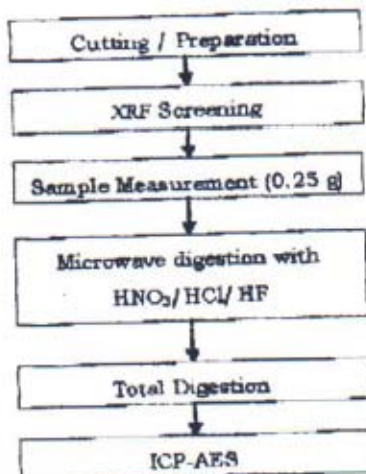
## Test Report

SHINKONG SYNTHETIC FIBERS CORPORATION  
8F., NO.123, SEC. 2, NANKING E. RD., TAIPEI, TAIWAN

Report No. : CE/2006/13401  
Date : 2006/01/19  
Page : 4 of 5

- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) Name of the person who made measurement: Anren Lee
- 3) Name of the person in charge of measurement: Daniel Yeh

### Flow Chart of Digestion for Plastic -EPA3052 for Pb, Cd (without residual)



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## Test Report

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Report No. : CE/2006/13401  
Date : 2006/01/19  
Page : 5 of 5



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5002  
E002

17-02/2006 13:01 FAX 00  
17-02/2006 13:01 FAX 00

# Sleeve

**SGS**

## Test Report

No.: GZSC051191892/LP

Date: NOV 29, 2005

Page 1 of 2

NEW-MINGTAI ELECTRONIC HARDWARE ELECTROPLATE FACTORY  
OLD VILLAGE HALL (LAOXIANGFU), TONG-LE VILLAGE, LONG-GANG TOWN, SHENZHEN

Report on the submitted sample said to be 无铅锡/GP Sn

SGS Ref No. SZ051125313EC-3.1  
Sample Receiving Date NOV 23, 2005  
Testing Period NOV 23, 2005 TO NOV 29, 2005

Test Requested (1) As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.  
(2) Determination of PBBs (polybrominated biphenyls), PBDEs (Polybrominated diphenylethers) of the submitted sample.

Test Method (1) Lead content - With reference to EPA method 3050B: 1995 / other acid digestion.  
Cadmium content - With reference to BS EN1122: 2001 method B / other acid digestion.  
Mercury content - With reference to EPA 1631: 1995 / 7473: 1999 / other acid digestion.  
Hexavalent Chromium content - With reference to ISO 1513: 2000 (Class 6.8).  
Analysis was performed by Atomic Absorption Spectrometer / Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES). UV-VIS Spectrophotometer  
(2) With reference to EPA 3540C / 3550C, Analysis was performed by GC/MS

RESULTS Please refer to next page

Signed for and on behalf of  
SGS-USTC Ltd

  
Zhang Li Amy  
Sr Engineer

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GZCM 370029

NOV 21 2005 09:16

PHONE NO.: 84292867

FROM: Xiangxin

1 #21'r

**SGS**

## Test Report

No.: GZSCR051191692/LP

Date: NOV 29, 2005

Page 2 of 2

## Results:

(1)

| Item                        | Unit   | MDL  | Silvery metal part |
|-----------------------------|--------|------|--------------------|
| Lead Content (Pb)           | ppm    | 2    | 28                 |
| Cadmium Content (Cd)        | ppm    | 2    | N.D.               |
| Mercury Content (Hg)        | ppm    | 2    | N.D.               |
| Hexavalent Chromium (Cr VI) | µg/cm² | 0.02 | N.D.               |

Note: - N.D. = Not Detected (&lt; MDL)

- MDL = Method Detection Limit

- ppm = mg/kg

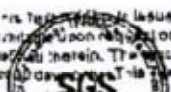
(2)

|                                              | Silvery metal can |
|----------------------------------------------|-------------------|
| <b>Flame Retardants</b>                      |                   |
| <b>Polybrominated Biphenyls (PBBs)</b>       |                   |
| Monobromobiphenyl                            | N.D.              |
| Dibromobiphenyl                              | N.D.              |
| Tribromobiphenyl                             | N.D.              |
| Tetrabromobiphenyl                           | N.D.              |
| Pentabromobiphenyl                           | N.D.              |
| Hexabromobiphenyl                            | N.D.              |
| Heptabromobiphenyl                           | N.D.              |
| Octabromobiphenyl                            | N.D.              |
| Nonabromobiphenyl                            | N.D.              |
| Decabromobiphenyl                            | N.D.              |
| <b>Polybrominated Diphenylethers (PBDEs)</b> |                   |
| Monobromodiphenyl ether                      | N.D.              |
| Dibromodiphenyl ether                        | N.D.              |
| Tribromodiphenyl ether                       | N.D.              |
| Tetrabromodiphenyl ether                     | N.D.              |
| Pentabromodiphenyl ether                     | N.D.              |
| Hexabromodiphenyl ether                      | N.D.              |
| Heptabromodiphenyl ether                     | N.D.              |
| Octabromodiphenyl ether                      | N.D.              |
| Nonabromodiphenyl ether                      | N.D.              |
| Decabromodiphenyl ether                      | N.D.              |

Note: - N.D. = Not Detected (&lt; 5 ppm)

- ppm = mg/kg

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GZCM 379028

**SGS****Test Report**

No.: GZ0602013169/CHEM

Date: FEB 17, 2006

Page 1 of 1

SHEN ZHEN HUEYNITEH CO., LTD

5/F BUILDING, BAI SHI ZHOU YUAN ZINENG INDUSTRIAL ZONE, SHAHE TOWN, SHEN ZHEN CITY

Report on the Submitted sample said to be 黃銅

SGS Ref No.: SZ060204487RS-4.1

Material: Cu

Buyer: SONY

Sample Receiving Date: FEB 13, 2006

Testing Period: FEB 13, 2006 TO FEB 17, 2006

Test Requested: As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample.

Test Method: Lead content - With reference to EPA method 3050B: 1996 / other acid digestion  
 Cadmium content - With reference to BS EN1122: 2001 method B / other acid digestion  
 Mercury content - With reference to EPA 3052: 1996 / 7473: 1998 / other acid digestion  
 Hexavalent Chromium content - With reference to EPA 3060A: 1996 & EPA 7196A: 1992  
 Analysis was performed by Atomic Absorption Spectrometer / Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES) / Direct Mercury analyzer / UV-VIS Spectrophotometer.

**Results**

| Item                        | Unit | MDL | Golden metal |
|-----------------------------|------|-----|--------------|
| Lead Content (Pb)           | ppm  | 2   | 186          |
| Cadmium Content (Cd)        | ppm  | 2   | N.D.         |
| Mercury Content (Hg)        | ppm  | 2   | N.D.         |
| Hexavalent Chromium (Cr VI) | ppm  | 2   | N.D.         |

Note: - N.D. = Not Detected (&lt; MDL)

- MDL = Method Detection Limit

- ppm = mg/kg

\*\*\* End of Report \*\*\*

Signed for and on behalf of  
 SGS-CSTC Ltd.

  
 Huang Fang, Sunny  
 Sr. Engineer

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**GZCM G21860**

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 中国·广州·经济技术开发区科学城科园路198号 邮编: 510661 Tel: 86-20-62155555 Fax: 86-20-62095125

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# Rivet



## Test Report

WANSIH ELECTRONIC CO., LTD.  
3F 72 WU KONG 6TH RD., WU KU INDUSTRIAL DISTRICT  
TAIPEI HSIEN, TAIWAN. R. O. C.

報告號碼 : CE/2005/B4807  
日期 : 2005/11/28  
頁數 : 1 of 2

以下測試樣品乃供應廠商所提供及確認：

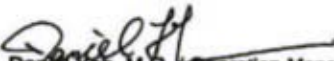
樣品名稱 : 固定鉚釘 (黑鍍)  
收件日期 : 2005/11/21.  
測試日期 : 2005/11/21 TO 2005/11/28

### 測試結果

測試部位 NO.1 : 黑色鉚釘

| 測試項目 | 單位  | 測試方法                                                           | 偵測極限值 | 結果   |
|------|-----|----------------------------------------------------------------|-------|------|
|      |     |                                                                |       | NO.1 |
| 六價鉻  | ppm | 依照US EPA 3050A方法, 用UV-VIS<br>微分析                               | 2     | N.D. |
| 鎘    | ppm | 依照 EN1122 方法B:2001或其他酸<br>消化方法, 用感應耦合電漿原子發<br>射光譜儀(ICP-AES)微分析 | 2     | N.D. |
| 汞    | ppm | 依照 US EPA 3052 方法或其他酸<br>消化方法, 用感應耦合電漿原子發<br>射光譜儀(ICP-AES)微分析  | 2     | N.D. |
| 鉛    | ppm | 依照 US EPA 3050B 方法或其他酸<br>消化方法, 用感應耦合電漿原子發<br>射光譜儀(ICP-AES)微分析 | 2     | 29.5 |

備註: (1) N.D. = Not detected. (<MDL) / 未檢出(低於偵測極限值)  
(2) ppm = mg/kg / 百萬分之一  
(3) MDL= Method Detection Limit(偵測極限值)

  
Daniel Yeh, M.R., Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.

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## Test Report

WANSIH ELECTRONIC CO., LTD.  
3F 72 WU KONG 6TH RD., WU KU INDUSTRIAL DISTRICT  
TAIPEI HSIEN, TAIWAN, R. O. C.

報告號碼 : CE/2005/B4807  
日期 : 2005/11/28  
頁數 : 2 of 2



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