SHINKONG SYNTHETIC FIBERS CORP
223 YEN PING RD SEC 3, PIN CHENG TAOUYAN HSIEH 324 TW
E202G30
Polybutylene Terephthalate (PBT), glass reinforced, furnished as pellets

<table>
<thead>
<tr>
<th>Color</th>
<th>Min Thk (mm)</th>
<th>Flame</th>
<th>HWI</th>
<th>HAI</th>
<th>Electrostatic Imp</th>
<th>Str</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK</td>
<td>0.38</td>
<td>V-0</td>
<td>-</td>
<td>-</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>ALL</td>
<td>0.75</td>
<td>V-0</td>
<td>3</td>
<td>0</td>
<td>130</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>V-0, 5VB</td>
<td>0</td>
<td>130</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>BK</td>
<td>1.5</td>
<td>V-0, 5VA</td>
<td>2</td>
<td>130</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>ALL</td>
<td>3.0</td>
<td>V-0, 5VA</td>
<td>2</td>
<td>130</td>
<td>120</td>
<td>130</td>
</tr>
</tbody>
</table>

Comparative Tracking Index (CTI): 2
Inclined Plane Tracking (IPT): -
Dielectric Strength (kV/mm): 33
Volume Resistivity (10^6 ohm-cm): 16
High-Voltage Arc Tracking Rate (HVTR): 4
High Volt, Low Current Arc Resis (D495): 6
Dimensional Stability (%): -

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2000-06-24
Last Revised: 2012-11-07
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The materials covered in this database are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. THE
# Material Safety Data Sheet

**Product Name:** SHINITE® PBT E202G# (#: 5~40% glass content)

**Revision Number:** 2  
**Version Date:** 2010/5/22

## Material Safety Data Sheet

<table>
<thead>
<tr>
<th>1. <strong>Product name</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SHINITE® PBT E202G# (#: 5~40% glass content)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. <strong>Substance identity and company contact information</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPANY</td>
<td>Shinkong Synthetic Fibers Corporation, Engineering Plastic Division, 8F, 123, Sec. 2, Nanking East Road, Taipei, Taiwan</td>
</tr>
<tr>
<td>PHONE</td>
<td>02-2507-1251, 03-493-2131 ext 1730</td>
</tr>
<tr>
<td>FAX</td>
<td>02-2506-5047, 03-491-5763</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. <strong>Chemical composition and data on components</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Characterization:</td>
<td></td>
</tr>
<tr>
<td>Polybutylene Terephthalate (PBT) (CAS# 30965-26-5)</td>
<td></td>
</tr>
<tr>
<td>ISO 1043-4 Code number for Flame retardants: FR(17)</td>
<td></td>
</tr>
<tr>
<td>Glass Fiber (CAS# 65997-17-3)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. <strong>Hazards identification</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous Decomposition Products:</td>
<td></td>
</tr>
<tr>
<td>Processing fumes evolved at recommended processing conditions contain trace levels of THF (tetrahydrofuran) and may also contain trace levels of hydrogen bromide.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. <strong>First aid measures</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>If molten polymer contacts the skin or eyes, cool rapidly with cold water. DO NOT use solvent for removal.</td>
<td></td>
</tr>
<tr>
<td>DO NOT attempt to remove the polymer from the skin!</td>
<td></td>
</tr>
<tr>
<td>Obtain IMMEDIATE medical attention.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. <strong>Fire-fighting measures</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable - water spray and foam. Water is the best.</td>
<td></td>
</tr>
<tr>
<td>Approved pressure demand breathing apparatus and protective clothing should be used for all fires.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. <strong>Accidental release measures</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweep up and dispose in proper containers to prevent slipping hazards.</td>
<td></td>
</tr>
</tbody>
</table>
8. Handling and storage
Handling:
Follow recommendations in processing guide. Prevent contact with skin and eyes.
Provide adequate ventilation in molding work.

Storage:
Store in a cool and dry place. Keep containers tightly closed to prevent moisture absorption and contamination.

9. Exposure controls and personal protection
Industrial Hygiene:
A continuous supply of fresh air to the workplace together with removal of processing fumes through exhaust systems is recommended.

Personal Protective Equipment:
Respiratory protection - dust mask
Eye protection - safety glasses
Hand protection - thermal protective gloves should be worn around molten plastic

10. Physical and chemical properties
Melting Point (°C) : 225°C
Density @ 25°C : 1.35 - 1.75 g/cm³  ASTM D 1505
Form : Granules
Vapor Pressure : Not applicable
Solubility in Water : Insoluble
Ignition Temperature (°C) : 450°C, estimated

11. Stability and reactivity
Stability : Stable under recommended conditions of storage and handling.
Reactivity : Not reactive under recommended conditions of storage, handling, processing and use.
Thermal Decomposition : None under 400°C
Explosion : Not sensitive to impact and static discharge.
### 12. Toxicological information

Product not considered primary eye and skin irritant.
TOXIC : N/A

### 13. Ecological information

We recommend this material be disposed of by properly scrubbed incineration or recycling.
Not expected to present any significant ecological problems.

### 14. Disposal considerations

Product is not a RCRA hazardous waste. Recycling is encouraged. Dispose of using good manufacturing practices under local regulations for your area.

### 15. Transport information

<table>
<thead>
<tr>
<th>GGVSEE/IMDG Code :</th>
<th>UN No. : None</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICAO/IATA-DGR : Not Regulated</td>
<td>GGVE/GGVS :</td>
</tr>
<tr>
<td>RID/ADR :</td>
<td>ADNR :</td>
</tr>
<tr>
<td>DOT Hazard Class : Not Regulated</td>
<td></td>
</tr>
<tr>
<td>Proper Shipping Name : Not Regulated</td>
<td></td>
</tr>
<tr>
<td>Identification Number : Not Listed</td>
<td></td>
</tr>
<tr>
<td>TDGA : Not Listed</td>
<td></td>
</tr>
</tbody>
</table>

### 16. Regulations

TSCA Status : This product complies with Chemical Substance Inventory requirements of the US EPA Toxic Substances Control Act (TSCA).
WHMIS Classification : Not a controlled product.

### 17. Other information

SHINITE is a registered trademark of the SHINKONG SYNTHETIC FIBERS CO.
## 產品材質證明

New Chiu Sheng Synthetic Fiber Co., Ltd.

### 創造纖維股份有限公司

### 中壢廠

### 臺灣

8th Fl., 123, Sec. 2, Nan-King East Road, Taipei, Taiwan

Tel: 886-2-2507-0131 886-2-2507-1251 (30 Lines) 886-3-4932131

Fax: 886-2-2506-8047 886-3-491-5763

### 產品材質證明

**新耐特 (SHINITE) PBT**

规格 (GRADE): D202G# (①: 5~29% glass fiber content) / E202(%1) (①: 0~30% glass fiber content)

新耐特 (SHINITE) PBT 為新光合成纖維股份有限公司所產製的工程塑膠系列之一，經由混練程序製得。具有優越的機械性、高剛性、尺寸安定性、耐熱老化性和化學性質。

此外新耐特 (SHINITE) PBT D202G# / E202(%1)

製品組成如下:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Polybutylene Terephthalate (PBT)樹脂</td>
<td>50~80%</td>
<td>55~75%</td>
<td>40~60%</td>
<td>50~85%</td>
<td>55~75%</td>
<td>40~60%</td>
</tr>
<tr>
<td></td>
<td>CAS NO: 30965-26-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flame Retardant耐燃劑</td>
<td>7~24%</td>
<td>7~22%</td>
<td>7~22%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>CAS NO: 71342-77-3+01309-64-4</td>
<td>(6<del>18%+1</del>6%)</td>
<td>(6<del>16%+1</del>6%)</td>
<td>(6-16%+1~6%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Flame Retardant耐燃劑</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7~24%</td>
<td>7~22%</td>
<td>7~22%</td>
</tr>
<tr>
<td></td>
<td>CAS NO: 68928-70-1+01309-64-4</td>
<td>(6<del>18%+1</del>6%)</td>
<td>(6<del>16%+1</del>6%)</td>
<td>(6-16%+1~6%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Glass Fiber玻璃纖維</td>
<td>5~29%</td>
<td>12~18%</td>
<td>27~33%</td>
<td>0~30%</td>
<td>12~18%</td>
<td>27~33%</td>
</tr>
<tr>
<td></td>
<td>CAS NO: 65997-17-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additives添加劑</td>
<td>1~10%</td>
<td>1~10%</td>
<td>1~10%</td>
<td>1~10%</td>
<td>1~10%</td>
<td>1~10%</td>
</tr>
<tr>
<td></td>
<td>CAS NO: N.A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GREEN PRODUCT (無毒材料) 符合 RoHS、REACH (SVHC)

如有任何的問題及意見，歡迎撥空指教，謝謝。

ENPLA DIVISION

送出日期: October 13, 2010
1. PRODUCT AND COMPANY IDENTIFICATION

- **Product Name:** BRASS ALLOY
- **Synonyms:** JIS C2600 ~ C2801
- **Chemical Name:** Cu-Zn Alloy
- **Family:** Copper Metal alloy
- **Company Name:** Minchali Metal Industry Co., Ltd
- **Company Address:** No.11 Pei Yuan Rd. Chang-L Industrial District, Chung-Li City, Tao-Yuan County, Taiwan
- **Company Tel:** 886-3-4519898
- **Company Internet:** www.minchali.com.tw
- **Emergency Tel:** 8863-4519898

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Components</th>
<th>By Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-50-8</td>
<td>Copper (Cu)</td>
<td>59.0 ~ 71.5</td>
</tr>
<tr>
<td>7440-66-6</td>
<td>Zinc (Zn)</td>
<td>41.0 ~ 28.5</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>Lead (Pb)</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>Iron (Fe)</td>
<td>&lt;0.07</td>
</tr>
</tbody>
</table>

OSHA: In solid form, this material is not hazardous. Dust and fume: irritant, carcinogen, blood, lung, kidney, reproductive and developmental toxin, neurotoxin.

**In solid form, this material is not hazardous. Dust and fumes are hazardous materials.**

3. Hazards Identification

**WARNING!**

EXPOSURE TO DUST OR FUMES CAN CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. CONTAINS A MATERIAL WHICH MAY CAUSE BLOOD, KIDNEY, REPRODUCTIVE AND NEUROLOGICAL EFFECTS, CANCER. USE ONLY WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING.

HAZARD RATINGS (for dust of fume)  Degree of hazard (0=low, 4=extreme)
**Minchali metal**

Hazardous Materials Identification System (HMIS):  
Health: 2; Flammability: 0; Physical Hazard: None

**ACUTE EFFECTS:**

Eye: Dust of fume can cause irritation consisting of redness, swelling and pain.  
May cause conjunctivitis with repeated exposures.

Skin: Material not expected to be absorbed through the skin. Contact with dust may cause mild irritation consisting of redness and/or swelling.

Inhalation: Inhalation of high concentrations of metallic copper dusts of fumes may cause nasal irritation and/or nausea, vomiting and stomach pain. The metal fume may also produce influenza-like symptoms, known as metal fume fever. Symptoms of this reaction may include metallic taste, runny nose, nausea, fever and chills. These effects usually disappear within 24 hours.

Ingestion: Ingestion of large amounts of dust may cause nausea, diarrhea and/or stomach pain.

**Chronic Effects:** Prolonged or repeated skin contact with dust may cause more severe irritation or dermatitis. Prolonged or repeated inhalation of dust or fume may cause more severe irritation. Chronic exposure to lead can cause kidney damage, anemia, reproductive effects, developmental effects and permanent nervous system damage in humans including changes in cognitive function.

### 4. FIRST AID MEASURES

For fume and dust

<table>
<thead>
<tr>
<th>EYE CONTACT:</th>
<th>Immediately flush out fume and dust particles with large amounts of water for at least 5 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician at once.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKIN CONTACT:</td>
<td>If exposed to dust or fumes, wash skin with plenty of water. Remove contaminated clothing and shoes and launder before reuse. If skin irritation or rash develops and persists or recurs, get medical attention.</td>
</tr>
<tr>
<td>INHALATION:</td>
<td>If symptoms of lung irritation occur (coughing, wheezing or breathing difficulty), remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Get medical attention.</td>
</tr>
<tr>
<td>INGESTION:</td>
<td>Not a likely route of exposure for finished metal alloy. If dust is ingested, immediately drink water to dilute. Consult a physician if symptoms develop.</td>
</tr>
<tr>
<td>NOTE TO PHYSICIANS:</td>
<td>There is no specific antidote to the active ingredients in this product; use symptomatic treatment.</td>
</tr>
</tbody>
</table>

### 5. FIRE FIGHTING MEASURES

Explosive: No
**Minchali Metal**

<table>
<thead>
<tr>
<th>Combustible</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable</td>
<td>No</td>
</tr>
<tr>
<td>Burning Rate of Material</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Auto ignition Temp</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Dust may cause an ignitable and/or an explosive atmosphere.

**EXTINGUISHING MEDIA:**

For localized powder fires, smother with dry sand, dry dolomite, sodium chloride of soda ash. Use fire-extinguishing media appropriate to fight surrounding fire.

**SPECIAL FIRE/FIGHTING PROCEDURES:**

None required.

**6. ACCIDENTAL RELEASE MEASURES**

In dust form, this product may be an explosion hazard. Remove all sources of ignition. Dust of fume may be suppressed by the use of a local exhaust system.

<table>
<thead>
<tr>
<th>AIR</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td>Not applicable</td>
</tr>
<tr>
<td>EARTH</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**7. HANDLING AND STORAGE**

**HANDLING:**

Handling: Avoid dispersion of dust in air.

Storage:

Do not store at temperatures above. Not Applicable
Avoid to store in acid or alkaline environment.

**8. EXPOSURE CONTROLS/PROTECTION**

When this product is heated, fumes are generated, then the zinc oxide could be formed. The OSHA(PEL) and ACGIH(TLV) for Zinc Oxide Fume is 5 mg/m³

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>OSHA(PEL)</th>
<th>IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Cu) 7440-50-8</td>
<td>Dust 0.1 mg/m³</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Fume, Moist 1 mg/m³</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td>(Zn) 7440-66-6</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>(Pb) 7439-92-1</td>
<td>Dust &amp; Fume 0.05 mg/m³</td>
<td>No Data</td>
</tr>
<tr>
<td>(Fe) 7439-89-6</td>
<td>No Data</td>
<td>No Data</td>
</tr>
</tbody>
</table>

**ENGINEERING CONTROLS:**

Local exhaust ventilation is recommended if significant dusting occurs or fumes are generated. Otherwise, use general exhaust ventilation.
### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance - Physical State</td>
<td>Gold metallic - Solid</td>
</tr>
<tr>
<td>Melting point</td>
<td>930-1065°C</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific gravity (g/cc)</td>
<td>8.66</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Physical State</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH at 25°C</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

- **Stability**: Stable under normal temperatures and pressure.
- **Condition to Avoid**: Not affected by mechanical impact, shock, or by electrical discharge.
- **Material to Avoid**: Chlorine, Acetylene.
- **Hazardous Decomposition Products**: When heated to decomposition, may produce metal oxides and fumes. Inhalation of high concentration of metal fumes may cause a condition known as metal fume fever which is characterized by flu-like symptoms.
- **Hazardous Polymerization**: Will not occur.

### 11. TOXICOLOGICAL INFORMATION

**Potential Exposure Routes:**
- For dust: ingestion, inhalation, and eye contact.
- For fumes: inhalation and eye contact.

The finished alloy metal is not hazardous.
### For components:

<table>
<thead>
<tr>
<th>Components</th>
<th>Copper(Cu)</th>
<th>Zinc(Zn)</th>
<th>Lead(Pb)</th>
<th>Iron(Fe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD₅₀</td>
<td>3.5 mg/Kg.(mouse, intraperitoneal)</td>
<td>No Data</td>
<td>No Data</td>
<td>30 mg/Kg(mecake)</td>
</tr>
<tr>
<td>Dermal LD₅₀</td>
<td>375 mg/Kg(rabbit, subcutaneous)</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>Inhalation LC₅₀</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
</tr>
</tbody>
</table>

Sub-chronic/Chronic Toxicity: Not known or reported for this product. Lead has caused kidney, blood, and nervous system damage in laboratory animals.

Carcinogenicity: Not known or reported. The International Agency for Research on Cancer(IARC) lists lead as possibly carcinogenic to humans, group 2B.

Mutagenicity: Not known or reported. Lead has been shown to be mutagenic in several in vitro assays.

Reproductive or Developmental Effects: This product is not known or reported to be mutagenic. Lead has been shown to affect fetal development including birth defects and reduce male reproductive function in laboratory animals.

Neurological effects: Not known or reported. Lead has caused peripheral and central nervous system damage and behavioral effects in laboratory animals.

Interactions with other chemicals which enhance toxicity: Not known or reported.

### 12 ECOLOGICAL INFORMATION

Ecotoxicity: No data is available on this product.

Individual constituents are as follows:

Copper: The toxicity of copper to aquatic organisms varies significantly not only with the species, but also with the physical and chemical characteristics of the water, such as its temperature, hardness, turbidity and carbon dioxide content. Copper concentrations varying from 0.1 to 1.0 mg/l have been found by various investigators to be not toxic for most fish. However, concentrations of 0.015 to 3.0 mg/l have been reported as toxic, particularly in soft water to many kinds of fish, crustaceans, mollusks, insects, and plankton.

Lead: To bluegill, the LC₅₀ (48Hrs) is reported to be 2-5mg/l. Lead is toxic to waterfowl.

MOBILITY: Dissolved lead may migrate into soil.

PERSISTENCE / DEGRADABILITY: Lead may persist and accumulate in in the environment.

BIOACCUMULATION: No data
13. DISPOSAL CONSIDERATIONS
If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste. Care must be taken to prevent environmental contamination from the use of this material. This product may be a candidate for metal reclamation.

14. TRANSPORT INFORMATION
Care must be taken to prevent water unitary, falling from transportation.

15. REGULATORY INFORMATION
US FEDERAL

<table>
<thead>
<tr>
<th>TSCA</th>
<th>The components of this product are listed on the Toxic Substance Control Act inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERCLA</td>
<td>Copper, R.Q=5000 lbs. No reporting is required if diameter of the pieces of metal is equal to or exceeds 100 micrometers (0.0004 inches).</td>
</tr>
<tr>
<td>SARA 313</td>
<td>Copper, Zinc (Fume and Dust), Lead</td>
</tr>
<tr>
<td>SARA 313 Hazard Class</td>
<td>Health: For dust or fume only</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION
First Vision(V1) Date: 04-28-2003
Prepared By: Minchali Metal Industry Co., Ltd.

NOTICE: THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHC WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT, THIS MSDS INFORMATION IS RELIABLE AND CURRENT AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS.
**REPORT OF MATERIAL TEST**

**Materials Tested:**
- C 2680 R BRASS STRIP (H)

**Manufacture No.:**
- GAA176D

**Specification:**
- Standard

**Thickness (mm):**
- 0.200

**Width (mm):**
- 520,000

**Length (mm):**
- 600,000

**Chemical Analysis Test:**

<table>
<thead>
<tr>
<th>Element</th>
<th>Test</th>
<th>Upper Limit</th>
<th>Lower Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu</td>
<td>Test</td>
<td>54.000-68.000</td>
<td>55.415</td>
</tr>
<tr>
<td>Fe</td>
<td>Test</td>
<td>max. 0.050</td>
<td>0.020</td>
</tr>
<tr>
<td>P</td>
<td>Test</td>
<td>max. 0.0500</td>
<td>0.0029</td>
</tr>
<tr>
<td>Sn</td>
<td>Test</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Mechanical & Physical Test:**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Test</th>
<th>Upper Limit</th>
<th>Lower Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness Test (mm)</td>
<td>Test</td>
<td>0.050-0.005</td>
<td>0.200</td>
</tr>
<tr>
<td>Width Test (mm)</td>
<td>Test</td>
<td>0.000-0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Tensile Strength (kgf/mm²)</td>
<td>Test</td>
<td>42.00-65.00</td>
<td>43.80</td>
</tr>
<tr>
<td>Elongation (%)</td>
<td>Test</td>
<td>-</td>
<td>24.66</td>
</tr>
<tr>
<td>Hardness Test (Hv)</td>
<td>Test</td>
<td>145.0-155.0</td>
<td>146.0-147.0</td>
</tr>
<tr>
<td>Grain Size (m)</td>
<td>Test</td>
<td>-</td>
<td>25.10</td>
</tr>
<tr>
<td>Electric Conductivity (%)</td>
<td>Test</td>
<td>-</td>
<td>60.00</td>
</tr>
<tr>
<td>Bending Test (Good way)</td>
<td>Test</td>
<td>-</td>
<td>60.00</td>
</tr>
<tr>
<td>Bending Test (Bad way)</td>
<td>Test</td>
<td>-</td>
<td>60.00</td>
</tr>
<tr>
<td>Surface Roughness Ra (µm)</td>
<td>Test</td>
<td>-</td>
<td>0.11</td>
</tr>
</tbody>
</table>

**Other Information:**
- Out of stock

**Delivery No.:**
- 660359

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**手写内容:**

1/34 2Ω 81.84Ω x 55 192.84Ω x 32 49Ω x 57.1 354.8Ω
The following sample(s) was/were submitted and identified on behalf of the clients as : C2680

SGS Job No. : GZIN1801000834PC - GZ

Date of Sample Received : 06 Jan 2018

Testing Period : 06 Jan 2018 - 10 Jan 2018

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

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

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

Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Echo Yeung
Approved Signatory
Test Report
No. CANML1800458401 Date: 10 Jan 2018 Page 2 of 4

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description
SN1 CAN18-004584.001 Brassy metal sheet

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


<table>
<thead>
<tr>
<th>Test Item(s)</th>
<th>Limit</th>
<th>Unit</th>
<th>MDL</th>
<th>001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>100</td>
<td>mg/kg</td>
<td>2</td>
<td>ND</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>1,000</td>
<td>mg/kg</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>1,000</td>
<td>mg/kg</td>
<td>2</td>
<td>ND</td>
</tr>
<tr>
<td>Hexavalent Chromium (Cr(VI))</td>
<td>-</td>
<td>µg/cm²</td>
<td>0.10</td>
<td>ND</td>
</tr>
</tbody>
</table>

Notes:
(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series http://www.cenelec.eu/dyn/www/?p=104:30:1742232870351101::FSP_ORG_ID,FSP_LANG_ID:125863
7.25
(2) * = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI.
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating.
c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
Pb/Cd/Hg/Cr$^{6+}$ Testing Flow Chart

1) Name of the person who made testing: Edith Zhang
2) Name of the person in charge of testing: Bella Wang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr$^{6+}$ test method excluded).

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Sample Preparation

Sample Measurement

**Pb/Cd/Hg**

- Acid digestion with microwave / hotplate
- Filtration
- Solution
- Residue
- 1) Alkali Fusion / Dry Ashing
- 2) Acid to dissolve

**Cr$^{6+}$**

- Metallic material
- Boiling water extraction
- Adding 1,5-diphenylcarbazide for color development
- UV-Vis.
- DATA

**Nonmetallic material**

- Dissolving by ultrasonication
- Digested at 150~160°C
- Separating to get aqueous phase
- pH adjustment
- Adding 1,5-diphenylcarbazide for color development
- UV-Vis.
- DATA

**ABS/PC/PVC Others**

- Digested at 60°C by ultrasonication
- Separating to get aqueous phase
- pH adjustment
- Adding 1,5-diphenylcarbazide for color development
- UV-Vis.
- DATA
SGS authenticate the photo on original report only

*** End of Report ***
SHENZHEN XIN GUAN DA INDUSTRY CO., LTD
ZHANQI INDUSTRIAL ZONE HOUTING SHAJING BAOAN DISTRICT SHENZHEN CITY

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

SGS Job No.: RP17-005612 - SZ
Date of Sample Received: 13 Jun 2017
Testing Period: 13 Jun 2017 - 16 Jun 2017
Test Requested: Selected test(s) as requested by client.
Test Method: Please refer to next page(s).
Test Results: Please refer to next page(s).
Conclusion: Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Tina Fan
Approved Signatory
Test Results:

Test Part Description:

Specimen No. | SGS Sample ID | Description
---|---|---
SN1 | SZX17-005621.003 | Golden plated metal

Remarks:

1. $1 \text{ mg/kg} = 1 \text{ ppm} = 0.0001\%$
2. MDL = Method Detection Limit
3. ND = Not Detected ($< \text{ MDL}$)
4. ":-" = Not Regulated


Test Method:
1. With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
2. With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
3. With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.

<table>
<thead>
<tr>
<th>Test Item(s)</th>
<th>Limit</th>
<th>Unit</th>
<th>MDL</th>
<th>003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>100</td>
<td>mg/kg</td>
<td>2</td>
<td>ND</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>1,000</td>
<td>mg/kg</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>1,000</td>
<td>mg/kg</td>
<td>2</td>
<td>ND</td>
</tr>
</tbody>
</table>

Notes:

1. The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
2. IEC 62321 series is equivalent to EN 62321 series:
3. •= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm². The sample coating is considered to contain CrVI
   b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-CrVI based coating
   c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
ATTACHMENTS

Pb/Cd/Hg/Cr\textsuperscript{6+} Testing Flow Chart

1) Name of the person who made testing: Winsen Deng / Truly Ren
2) Name of the person in charge of testing: Zoe Luo / Muky Tong
3) These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr\textsuperscript{6+} test method excluded)

\begin{itemize}
  \item Sample Preparation
  \item Sample Measurement
  \item Pb/Cd/Hg/Cr
  \item Acid digestion with microwave / hotplate
  \item Filtration
  \item Solution
  \item Residue
  \item 1) Alkali Fusion / Dry Ashing
  \item 2) Acid to dissolve
  \item Nonmetallic material
  \item Abs/PC/PVC
  \item Others
  \item Metallic material
  \item Boiling water extraction
  \item Digesting at 150\textendash{}160°C
  \item Dissolving by ultrasonication
  \item Separating to get aqueous phase
  \item pH adjustment
  \item Adding 1,5-diphenylcarbazide for color development
  \item UV-Vis
  \item DATA
\end{itemize}
Test Report

No. SZXEC1700562105  Date: 16 Jun 2017  Page 4 of 4

Sample photo:

SGS authenticate the photo on original report only

*** End of Report ***
Test Report

No. SZXEC1700562101  Date: 16 Jun 2017  Page 1 of 4

SHENZHEN XIN GUAN DA INDUSTRY CO., LTD
ZHANQI INDUSTRIAL ZONE HOUTING SHAJING BAOAN DISTRICT SHENZHEN CITY

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

SGS Job No.:  RP17-005612 - SZ

Date of Sample Received:  13 Jun 2017

Testing Period:  13 Jun 2017 - 16 Jun 2017

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

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

Test Results:  Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Conclusion:  

Tina Fan
Approved Signatory
Test Report

No. SZXEC1700562101  Date: 16 Jun 2017  Page 2 of 4

Test Results:

Test Part Description:

<table>
<thead>
<tr>
<th>Specimen No.</th>
<th>SGS Sample ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN1</td>
<td>SZX17-005621.001</td>
<td>Silver-gray plated metal</td>
</tr>
</tbody>
</table>

Remarks:

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


Test Method:

(1) With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
(2) With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
(3) With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
(4) With reference to IEC 62321-7-1:2015, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

<table>
<thead>
<tr>
<th>Test Item(s)</th>
<th>Limit</th>
<th>Unit</th>
<th>MDL</th>
<th>Limit Unit MDL 001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>100</td>
<td>mg/kg</td>
<td>2</td>
<td>ND</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>1,000</td>
<td>mg/kg</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>1,000</td>
<td>mg/kg</td>
<td>2</td>
<td>ND</td>
</tr>
<tr>
<td>Hexavalent Chromium (Cr(VI))</td>
<td>-</td>
<td>µg/cm²</td>
<td>0.10</td>
<td>ND</td>
</tr>
</tbody>
</table>

Notes:

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
(2) ▼: a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm2. The sample coating is considered to contain CrVI
b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm2). The coating is considered a non-CrVI based coating
c. The result between 0.10 µg/cm2 and 0.13 µg/cm2 is considered to be inconclusive - unavoidable coating variations may influence the determination.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
1) Name of the person who made testing: Winsen Deng / Truly Ren
2) Name of the person in charge of testing: Zoe Luo / Muky Tong
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ test method excluded)

**Sample Preparation**

**Sample Measurement**

**Pb/Cd/Hg/Cr**

Acid digestion with microwave / hotplate

Filtration

Solution

Residue

1) Alkali Fusion / Dry Ashing  
2) Acid to dissolve

**Nonmetallic material**

Dissolving by ultrasonication

Digesting at 150~160°C

Separating to get aqueous phase

Metallic material

Boiling water extraction

**Cr6+**

Adding 1,5-diphenylcarbazide for color development

**Others**

ABS/PC/PVC

**DATA**

**DATA**

**ICP-OES/AAS**

**DATA**

**pH adjustment**

**Adding 1,5-diphenylcarbazide for color development**

**UV-Vis**

**DATA**

**DATA**
Sample photo:

**SGS authenticate the photo on original report only**

*** End of Report ***