



广东恩威视科技有限公司

Guangdong Envision Technology Limited

物料承认书

文件编号:RD-ACK-RC - 版本:

ComponentItem 物料编号	
PartName 物料名称	BT Antenna
Specification 物料规格	BT Antenna L=80MM MHF, YJT01.182.023.302A
有害环境物质管理要求 (依照最新法规公布实施的 管控标准和清单执行)	☒ RoHS 2.0(2011/65/EU) ☐ REACH ☐ CP65 (加州 65) ☐ CPSIA ☐ ASTM F963 ☐ EN71 ☐ MSDS ☐ TSCA ☐ 其它:
Datasheet 物料规格书	

COMPANY APPROVED 本厂承认		
Approved By 批准:	Checked By 审核:	Compile By 编制:
Data 日期: 年 月 日	Data 日期: 年 月 日	Data 日期: 年 月 日

SUPPLIER CONFIRMED 供应商确认	
有害环境物质测试报告编号:	A2230400553101001E,EKR23700180,SHAEC24000428805 A2230400553101002E,(8824)054-0003,SHAEC23019069715 A2240168137102001,A2240187677101001,ETR23701480 A2230601245104001C,A2230643348101001 CANEC24000977302,SHAEC23021627701
供应商签名/公章:	

变更履历表

版本	变更内容	工程师确认	审核/日期	批准/日期
1	首次发行	邓磊	2024/6/3	2024/6/3
2				
3				
4				

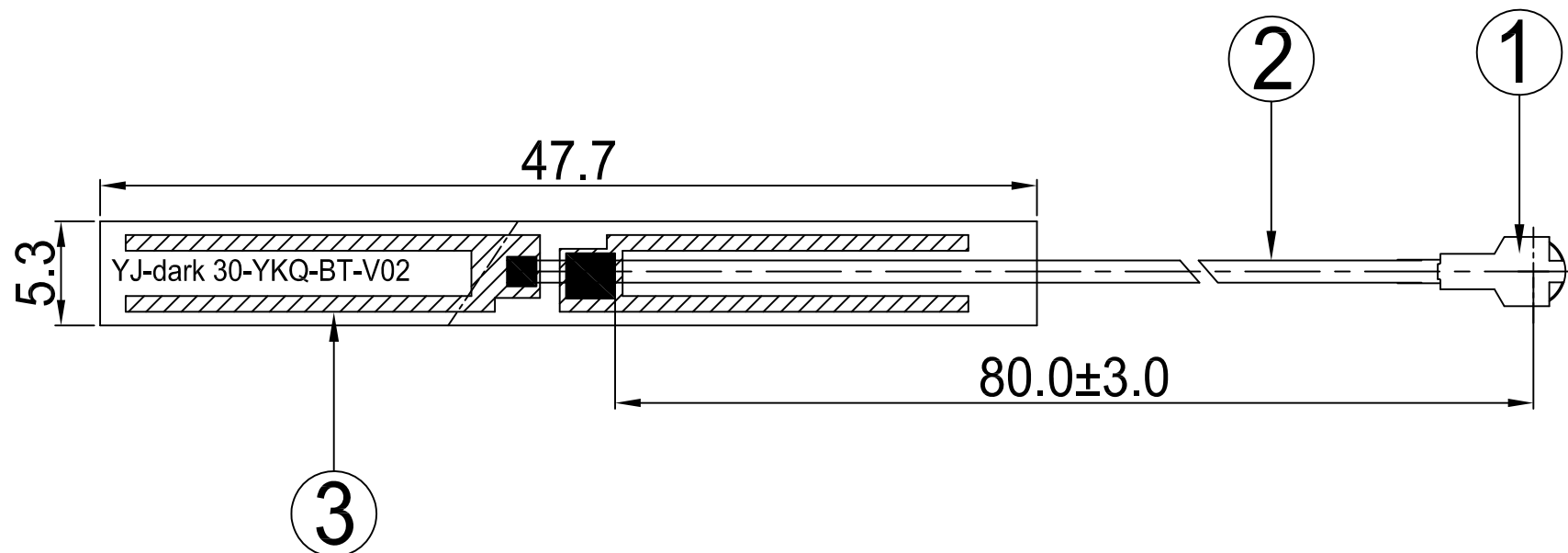
供应商对已承认物料做出工程变更或原料变更时，必须要本公司重新承认



承认书项目表

NO	内 容 (Contents)	页 数 (Number of Page)	页 码 (Page Code)
1	承认书封面 (Spec Cover)	1	1
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11	N/A	N/A	N/A
12	-	-	-
13	-	-	-

REV.	DESCRIPTION	DATE
A	首次发行	2023-06-20



A	3	FPC	47.7*5.3mm	FPC	FPC11XXXA.P01	1
	2	Coaxial Cable	O.D.0.81 Black	O.D.0.81	COA100XXA.P01	1
	1	Mini Connector	Au Plated 3代	Cu	TER100XXA.P01	1
	NO	PART NAME	DESCRIPTION	Material	Part Number	Q.TY

 东莞市一佳电子通讯科技有限公司 Dongguan YiJia Electronics Communication Technology Co.,Ltd. Tel :0769-82586086 Fax:0769-82586086					
PART NAME: BT Antenna L=80MM MHF					
PART NO.: YJT01.182.023.302A			DATE: 2023-06-20		
APPROVED BY	CHECKED BY	DESIGNED BY		Tolerance	
陆明兰	邓磊	廖光喜		UNITS: mm	X.X ±0.50
				SCALE: 1/1	X.XX±0.15
			REVISION: A	X° ±3°	



天线规格

Antenna Specification

Electrical Properties

Frequency	2.4-2.5GHz
Impedance	50 Ohm Nominal
V.S.W.R	2.0 Max
Gain	2.4 dBi
Radiation	Omni-directional
Polarization	Linear

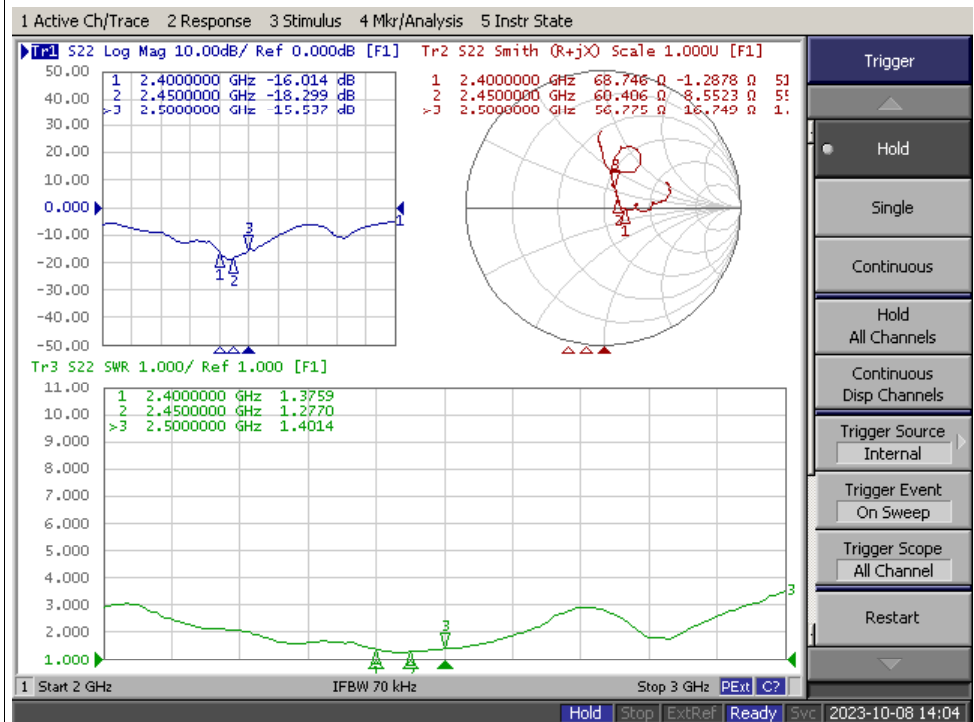
Physical Properties

Connector	3代IPEX
Cable Type	O.D.0.81mm
Cable Length	80mm
Cable Color	Black
Operating Temp.	-40 ~ +85 °C
Storage Temp / Humidity	25±5°C / <70%



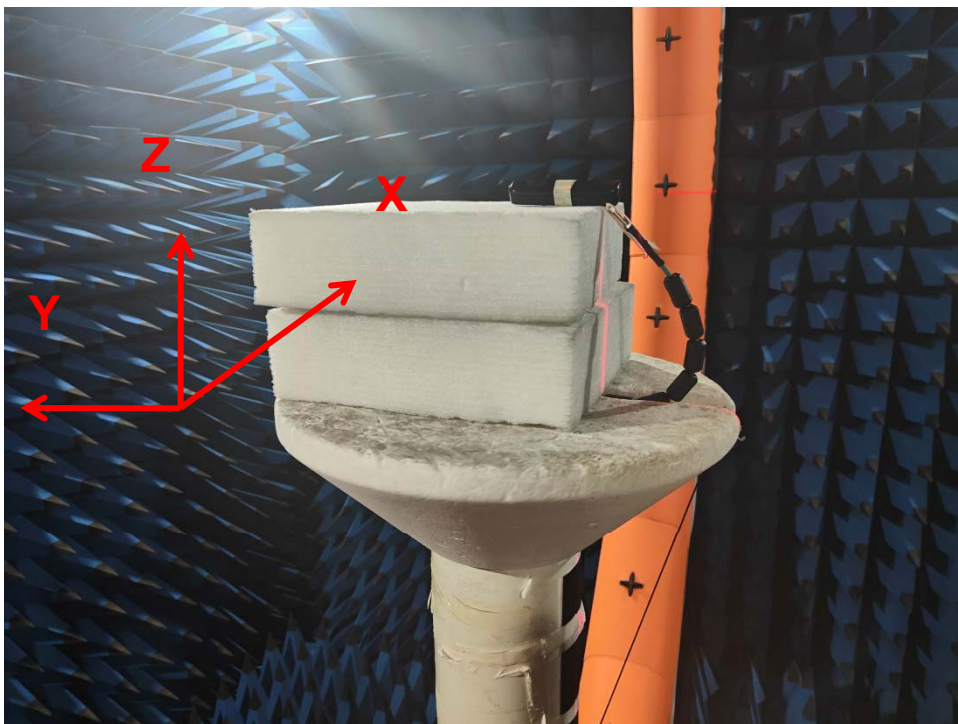
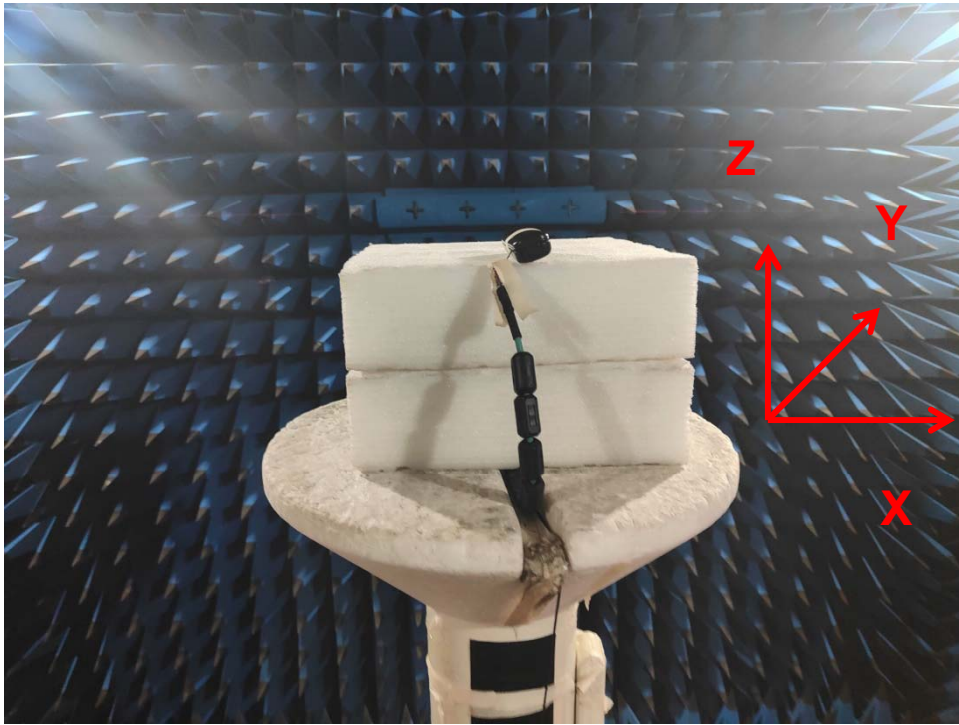
Antenna Performance Test

**Agilent
E5071B
S11
Parameter
Test //
BT
Antenna**





Antenna Passive Test



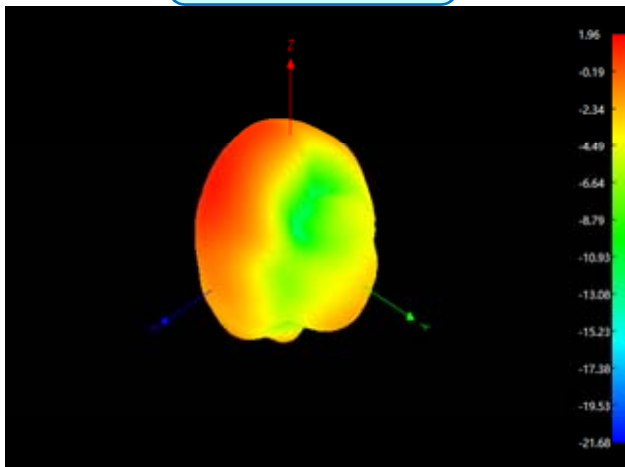


Passive Test For BT Antenna			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	44.9	-3.5	2.0
2410	45.7	-3.4	1.9
2420	45.5	-3.4	1.8
2430	45.8	-3.4	1.8
2440	45.8	-3.4	1.7
2450	48.9	-3.1	2.1
2460	47.3	-3.3	1.6
2470	48.9	-3.1	2.2
2480	47.4	-3.2	2.0
2490	48.3	-3.2	2.4
2500	45.7	-3.4	2.1

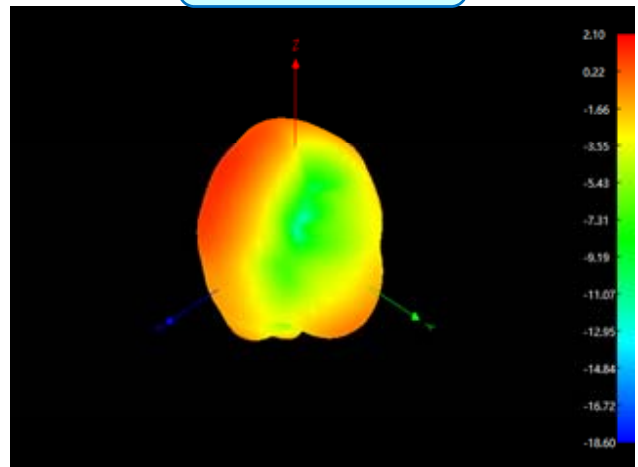


Radiation Pattern For BT Antenna

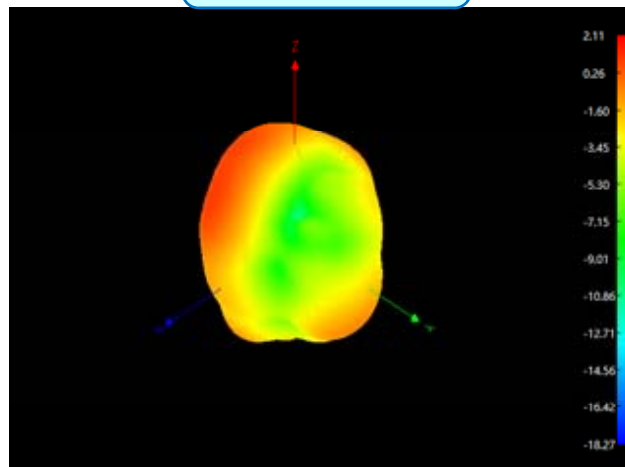
2400MHz



2450MHz



2500MHz





Device





BT Antenna





BT Antenna



First, chemical products and materials for business

Chemical name: PSM-800FSDM-A/SMH-800 liquid solid plate ink
Other names:
Use and restricted use of construction: flexible printed circuit board (PI/Cu), hand machine roof board
Name, address and address of the creator, entrant or supplier: Creator: Yueli Reachability Co., Ltd. Address: No.22 Jingjian Fourth Road, Guanyin District, Taoyuan City: 886-3-4836651
Urgent/true: 886-3-4836651, true: 886-3-4837487

Second, the hazard identification of resources and materials

Hazard classification of chemical products:
Health and environmental hazards: Acute toxicity (swallowing) 4, rot/skin irritation 2, heavy weight/eye irritation 2, skin Pass sensitive substance first, carcinogenic substance second, and hazardous substance second (acute toxicity).
Indication of content:
Symbol number:

Warning language:
Warning hazard
warning interest:
Harmful to swallow Cause skin irritation Causing severe eye irritation may cause skin hypersensitivity and suspected carcinogenesis Toxic to aquatic organisms
Hazard prevention measures:
Put the container in a place with good ventilation far away from the high temperature Do not eat or drink when using Remove the blindfold/face mask immediately when your clothes are contaminated If you touch your eyes, wash them with plenty of water immediately, and then ask the mud to wear suitable gloves Do not inhale gas/gas/steam gas/gas before use Place it in the upper lock Do not place until you know all safety precautions Avoid releasing release in the environment
Other hazards:-

III. Composition
identification of

PSM-800FSDM-A/SMH-800



， 安 全 資 料 表

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capital mixture:

Liquid solid plate ink PSM-800FSDM-A/SMH-800		
Chemical geology:		
Chinese and English names of hazardous components	Register number of Chemical Digest Service (CAS No.)	Degree or degree (percentage of components)
Oxygen acrylate oligmer Epoxy acrylate oligmer	28064-14-4	50%
Silicon dioxide Fused silica	7631-86-9	13%
Aromatic solution	64742-94-5	4%

Methyl dipropylene glycol	34590-94-8	4%
Carbon black	1333-86-4	3.5%
BaSO ₄ sulfate	13462-86-7	24%
Photoinitiator and the others	5495-84-1	1.5%

Fourth, first aid measures

First aid methods for the same road:

Inhalation: 1. Take self-protection measures before rescue.

2. Remove pollution sources or move patients to new places.

3. If a patient stops breathing, artificial respiration should be given immediately by the person who has been adalmed. If the heart stops, cardiopulmonary resuscitation should be given. When the patient inhales and swallows toxic substances, mouth-to-mouth artificial respiration should be used directly, and pocket masks and other medical equipment should be used for artificial respiration.

4. Maintain the patient's safety and normal temperature. 6. Treat the cure quickly.

Pi Mo: Wash the contaminated area with harmonious water for at least 20 minutes, and remove contaminated clothes, shoes and leather products before water. Eye touching: Immediately open the eyelids and wash the contaminated eyes with water for at least 20 minutes, and immediately take care of them.

Intake: 1. If the patient will be frustrated, or has been frustrated, he can feed anything.

2. It can induce vomiting and give 240-300ml of water.

3. If you vomit spontaneously, rinse your mouth and supply water repeatedly.

The most important diseases and harmful effects:-

Protection against first aid workers:-

Tips for doctors:-

V. Fire measures

Suitable for fire: chemical dry powder, wine foam, carbon dioxide, water, fire: water, water, foam water.

Special hazards that may be encountered during fire;

1. Its steam gas and decomposition products are burning and toxic.

2. Its steam gas is heavier than its empty gas, and it can spread to distant fire sources and give birth to tempering.

3. The combination of steam and big gas may lead to explosion.

4. When this object is indoors, outdoors or in sewers, it is in danger of steam explosion.

Special Fire Procedure:

1. In a safe distance from the place of fire, keep in the upwind position.

2. You can use water containers to disperse steam gas to wash the leakage and sparse the leakage, so as to protect the rescue staff.

3. Water in the flame of the container around, so that the container is cold, until the fire is cold. Keep the bottom of the container safe.

4. Poker or move all ignition sources.

Special protection of firefighters: Firefighters must wear air respirators, fire clothing and protection gloves.

VI. Leakage and management methods

Things people should pay attention to:

1. Restrict personnel from entering until the spillover area is completely cleaned up.

2. The work of cleaning up by the person who is negated.

3. Wear appropriate civil air defense.

Attention to matters in the environment:

1. Remove the ignition source.

2. Maintain ventilation in the leakage area.

3. Be in the upper wind and avoid going into the lower place.

4. Remove or separate burning and combustible materials under conditions that endanger the safety of people.

5. At least 100 to 200 meters away from the pollution source.

Cleaning method:

1. You can touch the leaked materials.

2. Avoid leakage entering sewers or dense spaces.
3. Where safety permits, prevent or reduce spills.
4. Block the leakage with soil, sand or similar and combustible objects that will respond to the leakage.
5. When there is a small amount of spill, it should be absorbed by the reaction with the leakage. Contaminated absorbed and discharged materials have the same model
6. Harmfulness must be placed in the appropriate container that is covered and indicated. Wash the spill area with water.
7. When there is a large amount of spill: fire fighting, emergency management and business response to seek help.

VII. Safe Location and Storage Methods

Place:

1. It is stored in a place where it is dry and ventilated, and avoids direct light and ignition source.
2. Far away things such as strong oxides, strong acids and water.
3. Use grounding, use the device without spark, and ventilate the wind system.
4. Store a small amount in the refrigerator, and use the explosion-proof refrigerator.
5. Department of police reports leaked outside the city.
6. It is necessary to separate the storage area from the work area, restrict people from entering and leaving the storage area, and show warnings.
7. Avoid collision, and the nearest fire system.
8. You can work alone, and another person needs to be on standby for rescue.
9. In the work area, use the containers that can be used to burn the liquid body, and all the barrels and slots should be grounded, and the containers must be connected to each other.
10. Use the smallest possible amount, and use a suitable ventilation system in the designated area.
11. The target indication container should be covered when in use.

Storage:

1. It is stored in a place where it is dry and ventilated, and avoids direct light and ignition source.
2. Store a small amount in the refrigerator, and use the explosion-proof refrigerator.
3. It is necessary to separate the storage area from the work area, restrict people from entering and leaving the storage area, and show warnings.
4. The target indication container should be covered when in use.

Eight, the preventive measures

Engineering control:

1. The wind system of the single use of the step to generate sparks and grounding.
2. The discharge port leads directly to the outside, and the important measures for protection are taken.
3. When using this object in large quantities, it may be necessary to install local gas and process dense.
4. Supply fully new and fresh air gas to supplement the air gas drawn out by filling and discharging the air gas system.

Control number:-

Average capacitance of eight small hours/average capacitance of short hours/maximum capacitance:-

Biological fingerprint:-

Civil air defense:

:: Breathing protection: 1. Chemical materials containing machine vapor poison cans or self-made breathing protection equipment.
2. Constant quantity type gas supply type breathing protection device, animation type breathing protection device containing machine steamed gas pot, mask containing machine steamed gas pot, comprehensive self-galvanizing breathing protection device, comprehensive gas supply type breathing protection device, and comprehensive chemical school poison breathing protection device containing machine steam poison pot. 3. Positive full-blown breathing protection equipment or positive full-blown gas-supplied breathing protection equipment with auxiliary positive self-blown breathing protection equipment.
4. There is a mask for steaming gas canister, and an escape type self-breathing protection tool.

Hand protection: Butyl rubber is the best, chlorinated polyethylene, polyvinyl acid, fluorinated cortex, butyl rubber/chloroprene rubber, fluorinated rubber, chloroprene rubber/natural rubber galaxy cover, fluorinated cortex/chloroprene rubber are also good anti-scorching gloves.

Eye protection: 1. Anti-chemical safety eye protection.

2. Full cover.

3. Don't wear shaped eyes.

1. Work shoes and body clothes.

2. There should be a bath/wash in the work area.

The measures for living:

1. Remove contaminated clothes quickly after work, and then wear them after washing them.

2. The work place is forbidden to smoke cigarettes or eat.
3. After taking care of this thing, you must wash your hands.
4. Keep the property clean.

IX. Physical and Chemical Geology

Outside (physical state, color, etc.): black cream	Gas flavor: bad smell
Olfactory value:-	Melting level:-25 °C
PH value:-	Boiling/boiling: 218-219 °C
Combustibility (solid and gas):-	Fire: > 75 °C
Decomposition temperature:-	The method of wearing a cup: () carrying a cup (V) wearing a cup
Spontaneous combustion temperature: spontaneous combustion	Explosion boundary:-
Steaming gas:-	Steaming density: 6.07
Density: 1.24 ~ 1.26 (water = 1)	Solubility: Slightly soluble in water
Octanol/water partition number (log Kow):-	Dispersion rate:-

X. Stability and Reaction

Stability: Stability under sealed dry container.
Possible hazard response under special conditions:-
Types to be avoided: leakage, flame and other ignition sources.
Things to avoid: acid, oxidation
Hazardous decomposition: carbon monoxide

XI. Toxic Materials

The road: leather, inhalation, eyes, food
Symptoms: irritation, drowsiness, dizziness, tiredness, pain, nausea, difficulty breathing and
Acute toxicity: Inhalation: 1. Steaming gas will irritate nose, throat and lungs. Pi Fou: 1. Liquid body or solution will cause heavy irritation and burning pain. 2. Steaming gas can cause irritation. 3. After being picked up by the skin, the liquid will be absorbed to the poisoned amount. Eyes: 1. Steaming gas will irritate eyes and stimulate them. 2. Liquid body will cause heavy burning and injury to eyes. Intake: 1. It will cause bright local irritation to the mouth and digestive tract.
Chronic toxicity or long-term toxicity:-

Twelve, raw materials

Raw toxicity:-
Persistence and degradation: Avoid entering the water source inlet and waterway, which is harmful to aquatic organisms.
Bioaccumulability:-
Reactionality in soil:-
Other good effects:-

XIII. Methods of abandoning and abandoning places

Discarding method: 1. Examining the principle of phase method. 2. According to the pieces of the store to be disposed of waste materials. 3. Specific incineration or burial can be used.
--

Fourteen, Dictate to send materials

Lian He Guo Bian No.:-



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The name of the joint country is:-
Classification of the hazards of Dirk: It is judged as ordinary goods according to Fujian Commercial Report 0128227
Packaging and fitting: It can be arranged according to ordinary goods
Marine pollutants (yes/no): no
Special delivery methods and precautions:-

XV. French Materials

Suitable usage:
1.If you work safely, you will be able to apply it
2.Road traffic safety rules
3.Methods and standards for the storage and removal of waste materials
4.Harmful academic products and general knowledge
5.What you can do in your work, what you can do, and what you can do

XVI. Other materials

Take part in the text	1.RTECS Materials, TOMES PLUS CD-ROM, Vol. 41, 1999 2.HSDB Materials, TOMES PLUS CD-ROM, Vol. 41, 1999
Superficial site	Mingjia: Youli Lian Lian Co., Ltd. Address/: No.22, Jingjian Fourth Road, Guanyin District, Taoyuan City: 886-3-4836651
Table person	Calling for: the principle of science and technology Name (Seal): Huang Zhihui
Table date	2021.01 1.10
Per	Among the above-mentioned materials, "-" means that there is no related materials at present, while the symbol number "/" means that this person is compatible with the material and is suitable for use

The above-mentioned materials are provided by our company, which is correct for the above-mentioned materials, but it is still difficult to avoid them.
The materials and materials of each project are only for reference, and users should judge their availability according to their corresponding needs.

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

- 1.1 Material Name: Flexible Copper-Clad Polyimide Laminates
1.2 Part Number: LPI-HF
1.3 Use of Material: Printed Circuit Boards
1.4 Date of Prepared: April 22nd, 2021
1.5 Company Identification: Jiu Jiang Flex Co., Ltd.
1210Qianjin Road (E) Jiujiang, Jiangxi, China 332006
1.6 Emergency Telephone Number: 86-792-8358899
1.7 Telephone Number for Information: 86-792-8358899, 8355813

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

Composition / substance		CAS#	%
PI	polyimide	25038-81-7	2.93~28.11
Adhesive	Epoxy resin	25036-25-3	2.42~6.81
	Flame Retardant (additive type)	225789-38-8	0.49~1.36
	Rubber	9003-18-3	1.45~3.99
Copper foil	Copper	7440-50-8	92.66~59.72

SECTION 3 HAZARDOUS IDENTIFICATION

Dust, soot, combustion gases produced when burning, of inhaled, ingested or absorbed through skin it will be harmful or irritating to the eyes, skin, mucous membrane, respiratory system, allergies can be caused to skin, flammable irritating and sensitive.

SECTION 4 FIRST-AID MEASURES (on Dust)**Inhalation:**

Remove to fresh air. Obtain medical attention if symptoms persist.

Eye Contact:

Flush immediately with large amounts of water. Do not rub eyes. Obtain medical attention if symptoms persist.

Skin Contact:

Wash area of contact thoroughly with soap and water. Do not rub or scratch. Obtain medical attention if symptoms persist.

Ingestion: Drinking water as much as possible, emetic, and see doctor.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Agents

Following extinguishing media can be used:

Carbon dioxide extinguisher

Dry powder fire extinguisher

Water Pump

Foam fire extinguisher

Hazards of Unusual burning and Explosion:

The material produces carbon monoxide, carbon dioxide, nitrogen, oxides of nitrogen, smoke and dust when extremely high temperature or burning.

Personal Protective Equipment

As in any burning, wear self-contained breathing apparatus and full protective gear.

Upper limit of Flammability: not ascertained

SECTION 6 EMERGENCY HANDLING OF LEAKAGE

Emergency handling:

Block the leakage area to avoid dust flying and wear protective equipment, use vacuum cleaner to clean the leakage.

SECTION 7 HANDLING AND STORAGE

Handling: Wear cotton gloves to protect product damage and hand lacerated.

Storage conditions

The material should be stored in dry, ambient temperature wrapped with PE film.

Environment: Keep away from heat, ignition sources, and direct sunlight.

Other conditions: Keep cartons tightly closed when not in use.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory protection:

No general requirements. If the occurrence of dust, gas or smoke processing or processing, is stimulating to employees, to use NIOSH/MSHA approved respiratory protection measures. Engineering control should be excluded from the need for respiratory support.

Ventilation:

Once air exhaust exposure exceeds limits, or visible smoke, dust, exhaust gas, the ventilation at site should be accompanied by all the heat process at the same time.

Mechanical operations:

Optimize and follow good industrial operation as possible as you can.

Eye Contact:

With eye-glasses on during all process

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance	PI film Copper-Clad Laminate with adhesive
Physical State:	solid
PH:	Not Applicable
Melting point:	no data
Relative density (water =1):	more than 1
Boiling point:	no data
The relative vapor density (air =1):	more than 1
Saturated vapor pressure (kPa):	Not Applicable
Heat of combustion (kJ/mol):	no data
The critical temperature (c):	Not Applicable
The critical pressure (MPa):	Not Applicable
The octanol / water partition coefficient of numerical:	Not Applicable
Flash point (°C):	Not Applicable
Upper explosive limit% (V/V):	Not Applicable
Ignition temperature (c):	no data
The lower limit of explosion% (V/V):	Not Applicable
Solubility:	insoluble
Application:	used for making printed circuit board

SECTION 10 STABILITY AND REACTIVITY

Stability:

Storage for one year at 5°C to 30°C and RH less than 75%

Conditions to Avoid:

High Humidity, direct sunlight,

The copper side may have violent reaction with followings:

Acetylene, ammonium nitrate, bromide, chlorate, iodic acid, chlorine, ClF_3 , $\text{Pb}(\text{N}_3)_2$,
($\text{Cl}_2 + \text{OF}_2$), ethylene oxide, fluoride, hydrogen peroxide, nitric acid hydrazide, hydrazoic acid,
 H_2S , K_2O_2 , NaN_3 , Na_2O_2 .

SECTION 11 TOXICOLOGICAL INFORMATION

Sensitization: Long time skin contact may cause dermatitis

Acute Poisoning: Inhalation of dust may cause thirst, fever, headache, weakness, symptom of respiratory disorders.

SECTION 12 ECOLOGICAL INFORMATION

Normal condition: No big influence may caused to ecology.

Waste Disposal Method

To dispose based on local, state or national laws.

Tank treatment: Not applicable.

SECTION 13 DISPOSAL CONSIDERATION

Hazardous wastage: NO.

Waste Disposal Method

To bury or burn at specified place based on national laws.

SECTION 14 TRANSPORTATION INFORMATION

No special regulation on this product for domestic or international transportation.

SECTION 15 REGULATORY INFORMATION

Must be complied with domestic or local regulation

SECTION 16 REGULATORY INFORMATION

14.1 INTERNATIONAL REGULATIONS:

EU Directive 2011/65/EU (RoHS): Compliant

SECTION 17 OTHER INFORMATION

Issued by: QC Department of Jiu Jiang Flex Co., Ltd

Disclaimer:

The data sheet information is true and accurate, but all statements and recommendations do not contain any guarantee. The consequence of the material shall be from practice. This report does not include all the circumstances that the user may encounter during operation. Each aspect of the operation may be increased or decreased during operation. All health and safety information contained in this report shall be submitted to you employees and customers. Users are responsible to take appropriate measures in practical operations.

CHUNG YU INDUSTRY CORPORATION

Material Safety Data Sheet

Section 1 : Chemical Product and Company Identification

Product name	Thermal curable two-component marking ink
Other means of identification	ZSR-150 ZM-400WF
Recommended use of the chemical and restrictions on use	Use in PCB fabrication.
Manufacturer/Supplier identification	CHUNG YU INDUSTRY COPORATION
Manufacturer/Supplier address	618 Yen-Ping Rd., sec. 3, Ping-Jeng, Tao-Yuan, Taiwan
Emergency telephone No.	(886-3)4641205
FAX No.	(886-3)4644839

Section 2 : Hazards Identification Information

Hazard classifications of the product	Inflammable liquids(II),Carcinogens, (II), Inhalation of hazardous substances (I)
Label elements	 Hazard symbols: Fire Caution catchwords: Danger Hazard massages: Inflammable liquids and vapor Harmful to swallow Skin irritation Eye irritation
Other hazards	—

Section 3 : Composition, Information on Ingredients

Mixture :

Chemical name	Concentration(% of contents)	CAS. NO.
Epoxy resin	50	25085-99-8
Barium sulfate	15	7727-43-7
Titanium dioxide	30	13463-67-7
Naphtha	5	8030-30-6

Section 4 : First-aid Measures

The first-aid measures for different exposure routes:	
Eyes contact	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
Skin contact	Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.
Swallow	Do not induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation	Remove from exposure to fresh air immediately.
The most important symptoms and hazardous effects	Headache, nausea
Notes to Physicians	Please provide the MSDS for physicians.

Section 5 : Fire-fighting Measures

Suitable fire extinguishing media	Chemical dry powders, chemical foam, carbon dioxide
General information	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Specific fire-fighting methods	It's not suitable to use water extinguish.

Section 6 : Accidental Release Measures

Person-related precautionary measures	Do not inhale vapors / aerosols. Ensure supply of fresh air in enclosed rooms.
Environmental-protection measures	Do not allow to enter sewerage system.
Procedures for cleaning / absorption	Take up with liquid-absorbent material. Forward for disposal. Clean up affected area

Section 7 : Safe Handling and Storage Measures

Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
Storage	Store in a cool(15~25°C), dry place. Keep container closed when not in use.

Section 8 : Exposure Controls Measures

Engineering controls	Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.				
Control parameters					
	Term	8 hours time weighted average exposure limits TWA	Short-term exposure limits STEL	Maximum limits CEILING	Biological standards BEIs
	Solvent	100ppm	125ppm	—	—
Personal protective equipment	Eye protection: Wear safety glasses and chemical goggles if splashing is possible. Skin protection: Wear appropriate protective gloves and clothing to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin. Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.				

Section 9 : Physical and Chemical Properties

Physical state : paste	Color : white
Odor threshold : —	Odor : slightly pungent
pH value : —	Melting point : —
Decomposition temperature : —	Boiling point : 110-190°C (solvent)
Flammability(solid, gas) : —	Flash point : 38-43°C (solvent)
Autoignition temperature : —	Test methods : —
Vapor pressure : <5 mmHg @ 25°C (solvent)	Explosion limits : —
Specific gravity/Density : 1.45~1.55 g/cm ³ (water=1)	Solubility in water : insoluble

Section 10 : Stability and Reactivity

Chemical stability	Stable under normal temperatures and pressures.
Conditions to avoid	Fire.
Incompatibilities with other materials	Strong oxidants.
Hazardous decomposition products	Irritating and toxic fumes and gases.
Hazardous polymerization	Has not been reported.

Section 11 : Toxicological Information

Information on the likely routes of exposure	Skins, swallow, inhale, eyes
Symptoms	Nausea, vertigo, irritation
Acute toxicity	Skins: Slight irritation Swallow: Nausea, vomit, and the other symptoms same as inhale Inhale: Cause the respiratory tract irritation, nausea, vomit, headache Eyes: The vapor cause eyes irritation LD50(solvent): >5000mg/kg (mouse, swallow) LC50: —
Further information	Further hazardous properties cannot be excluded. The product should be handled with the usual when dealing with chemicals

Section 12 : Ecological Information

Ecotoxic effect	Quantitative data on the ecologic effect of this product are not available.
Further ecologic data	No ecological problems are to be expected when the product is handled and due care and attention.

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

1. United Nation number (UN No.): 1866
2. UN proper shipping name: —
3. Transport hazard classes: 3
4. Packing group: —
5. Marine pollutant (Yes/No): No
6. Specific transport measures and precautionary conditions: —

Section 15 - Regulatory Information

1. European / International Regulations : European labeling in accordance with EC Directives.
2. Other using condition should follow local regulations.

Section 16 - Additional Information

Organization that prepared the MSDS	Name: R&D	TEL: (886-3)4641205	
	Address: 618 Yen-Ping Rd., sec. 3, Ping-Jeng, Tao-Yuan, Taiwan		
Person who prepared the MSDS	Job: manager	Name: Wan-Hua Lee	
Date the MSDS was prepared	2018/12/20		

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物质安全资料 (MSDS)

Material safety data

一. 物品与厂商资料 (Article and manufacturer information)

物品名称: 铜面抗氧化剂 OSP (Article name: copper surface antioxidant OSP)
物品编号 serial number: KBX-108H
联系电话 Contact number: 0755-27232150
传 真 Fax: 0755-29083002

二. 成份辨识资料 (Component identification data)

化学性质: 有机化合物之有机酸溶液 Chemical properties: organic acid solution of organic compounds			
危害物质名称 Name of hazardous	CAS 号 number	浓度范围 concentration range	备 注
冰醋酸 Glacial acetic	64-19-7	5%--15%	/
甲酸 formic acid	64-18-6	5%--10%	/
苯并咪唑 Imidazoprene	110534-15-1	3-5%	/
表面活性助剂 Surfactant	102-71-6	10%	/
纯净水 Purified water	/	77%--65%	/

三. 危害辨识资料 (hazard identification data)

最重要危害效应 Most important hazard effect	健康危害效应: 避免接触肌肤及眼睛. 穿著适当之防护衣物. Health hazard effect: avoid contact with skin and eyes. Wear appropriate protective clothing
	环境影响: 酸性 (Environmental impact: Acid)
	物理性及化学性危害: 腐蚀性 Physical and chemical hazards: corrosive
	特殊危害: 无 Special hazard: None

主要症状: 无 Main symptoms: None

物品危害分类: 未分类 Hazard classification: unclassified

四. 急救措施 (first aid measures)

不同暴露途径之急救方法: First aid methods of different exposure routes:

*皮肤接触: 若不慎与皮肤接触时, 立刻以大量清水冲洗, 最好是以淋浴冲洗, 于冲洗的同时, 将衣物脱下, 并继续冲洗最少 10 分钟, 若起水泡或持续红肿即刻就医, 受污染之衣物于再次使用前须水洗或干洗过。

*食入: 让伤者立即饮用 240-300ml 之水. 若伤者发生自然呕吐的情况时, 将伤者嘴部抬高并持续灌以开水. 以清水清洗嘴巴. 保持患者温暖并给予适当的休息, 即刻就医。

*Skin contact: in case of inadvertent contact with skin, wash immediately with plenty of water, preferably with a shower. Take off the clothes while washing, and continue to wash for at least 10 minutes. If there is blister or continuous swelling, see a doctor immediately. The contaminated clothes must be washed or dry cleaned before reuse.

*Ingestion: let the injured drink 240-300ml of water immediately. In case of natural vomiting, lift out the mouth of the injured and continuously fill with boiled water. Wash the mouth with clear water. Keep the patient warm and give proper rest, and seek medical treatment immediately.

*食入: 以清水冲洗嘴巴. 让患者饮用 1-3 杯以冲淡胃中的成份, 催吐并立即送医, 若患者逐渐丧失意识, 不可喂食任何食物。

眼睛接触: 立刻以大量清水冲洗眼睛, 并保持眼皮撑开, 且至少冲洗 15 分钟. 若持续红肿或疼痛即刻就医.,

吸入: 将患者移至空气新鲜处, 若呼吸困难则给予氧气帮助呼吸. 立即送医.

*Ingestion: rinse the mouth with clear water. Let the patient drink 1-3 cups to dilute the ingredients in the stomach, induce vomiting and send to the doctor immediately. If the patient gradually loses consciousness, do not feed any food

Eye contact: wash eyes immediately with plenty of water, keep eyelids open, and wash for at least 15 minutes. If there is continuous swelling or pain, see a doctor immediately,

Inhalation: move the patient to fresh air. If breathing is difficult, give oxygen to help breathe. Send to the doctor immediately

最重要症状及危害效应:

暴露途径: 吸入, 食入, 眼睛及肌肤接触吸收. 会影响眼睛, 皮肤, 呼吸系统, 肝脏, 肾脏, 血液, 神经系统.

对身体不同部位的危害:

眼睛: 水溶液或蒸气会严重刺激结膜及伤害眼角膜.

皮肤: 会对皮肤造成刺激. 若大面积的接触及长期暴露, 液体将经由肌肤吸收明显至毒的数量. 重复或长期接触有以下效应: 皮肤炎, 肝脏损伤, 肾脏损伤, 头痛, 中央神经系统衰竭, 血液失序, 暂时或永久性失明.

食入: 大量吞食会有以下效应: 严重刺激嘴巴, 喉咙和消化道, 肝脏损伤, 肾脏损伤, 中央神经系统衰竭, 血液失序, 暂时或永久性失明.
吞食可能会致命.

吸入: 暴露在蒸气或烟雾下会有以下效应, 严重刺激鼻子, 喉咙和呼吸道, 咳嗽, 呼吸困难, 恶心, 想睡, 肺水肿.

Most important symptoms and harmful effects:

Exposure route: inhalation, ingestion, eye and skin contact absorption. It will affect eyes, skin, respiratory system, liver, kidney, blood, nervous system

Hazards to different parts of the body:

Eyes: aqueous solution or vapor can seriously stimulate the conjunctiva and damage the cornea

Skin: can cause skin irritation. If large area contact and long-term exposure, the liquid will be absorbed through the skin to the amount of poison. Repeated or long-term contact has the following effects: dermatitis, liver damage, kidney damage, headache, central nervous system failure, blood disorder, temporary or permanent blindness

Ingestion: massive ingestion has the following effects: severe mouth, throat and digestive tract irritation, liver damage, kidney damage, central nervous system failure, blood disorder, temporary or permanent blindness

Swallowing can be fatal

Inhalation: exposure to vapor or smoke can have the following effects, severely irritating the nose, throat and respiratory tract, coughing,

Dyspnea, nausea, sleepiness, pulmonary edema

对急救人员防护：活性炭口罩，胶手套.

Protection for first aid personnel: masks, rubber gloves

对就医之提示：请依症状治疗.

Tips for medical treatment: please treat according to symptoms

五. 灭火措施(Extinguishing measures)

适用灭火剂:可使用喷水, 护醇泡沫, 干粉或二氧化碳灭火.

Suitable for extinguishing agents: spray water, alcohol foam, dry powder or carbon dioxide fire extinguishing.

灭火时可能遭遇之特殊危害：未知

Special hazards that may be encountered during fire fighting: unknown

特殊灭火程序：未知

Special fire fighting procedure: unknown

消防人员之特殊防护设备：请穿著全套衣物和配带自我维生装置

Special protective equipment for firefighters: please wear a full set of clothes and self-sustaining equipment

六. 泄漏处理方法: leakage treatment method:

处置:必须于通风之良好之状态下使用

Disposal: must be used in a well ventilated state

储存:必须储存在原来的容器中, 并存放于干燥低温, 通风良好, 远离直接日晒

Storage: must be stored in the original container, dry and low temperature, well ventilated, away from direct sunlight

七. 操作处置与储存 Handling and storage

操作注意事项：密闭操作。操作人员要注意个人防护。搬运时要轻拿轻放，防止包装或容器损坏。备配泄漏应急处理设备。倒空的容器可能残留有害物。

Operation precautions: closed operation. Operators should pay attention

to personal protection. Handle with care when handling to prevent damage to the package or container. Prepare leakage emergency treatment equipment. Empty containers may contain harmful substances.

储存注意事项:

储存于阴凉、干燥、通风良好的库房。库内湿度最好小于 85%。包装必须密封。应与易（可）燃物、碱类、氧化剂等分开存放，切忌混存。

储区应备有合适的材料收容泄漏物。

Storage precautions:

Store in a cool, dry and well ventilated warehouse. The humidity in the warehouse should be less than 85%. The packaging must be sealed. It shall be stored separately from inflammable (combustible), alkali, oxidant, etc., and shall not be mixed.

The storage area shall be equipped with appropriate materials to contain the leakage.

八. 暴露预防措施 Exposure precautions

工程控制: 建议使用工程化系统来预防或控制暴露的情形发生, 其中应包括人力的围堵, 机械式的通风设备(排气) 及处理时防护设备的控制。

Engineering control: it is recommended to use an engineering system to prevent or control the occurrence of exposure, which shall include the containment of manpower, mechanical ventilation equipment (exhaust) and the control of protective equipment during treatment.

控制参数:

*八小时日时量平均容许浓度/短时间时量平均容许浓度/最高容许浓度:1 毫克/立方

*生物指针:无

Control parameters:

*Eight hour daily average allowable concentration / short time average allowable concentration / maximum allowable concentration: 1 mg / m³

*Biological pointer: None

个人防护设备:

*呼吸防护:当有可能暴露于高蒸气浓度下, 需配带呼吸保护装置. 必须依据工作场地之空气中物质的浓度, 配戴适当之防毒面具且不可以超出防毒

面罩之工作时限.

*手部防护:配带nitrile或Butyl 橡胶制手套. 亦可使用你的专业安全人员建议的耐酸碱手套.

*眼睛防护:必须随时配戴护目镜.

*皮肤及身体防护:穿著一般工作服

Personal protective equipment:

*Respiratory protection: when it is possible to be exposed to high vapor concentration, it is necessary to wear respiratory protection device. It is necessary to wear appropriate gas mask according to the concentration of substances in the air of the workplace and the working time limit of the gas mask shall not be exceeded

*Hand protection: wear nitrile or butyl rubber gloves. You can also use the acid and alkali resistant gloves recommended by your professional safety personnel

*Eye protection: goggles must be worn at all times

*Skin and body protection: wear general work clothes

卫生措施:必须于通风良好之状态下使用.

Hygienic measures: it must be used in a well ventilated state

九. 物理及化学性质 Physical and chemical properties

物质状态:液体 Material state: liquid	形状: 液态 Shape: liquid
颜色: 蓝色至沉清液体	气味: 刺激性
PH 值: ≥ 3.0	沸点: 100℃
分解温度:	闪火点: 90 摄氏度
自燃温度:	爆炸界限: 无界定
蒸气压: 同水	蒸气密度: 重于空气
比重: 1.0-1.03	(对水)溶解度: 完全可溶解
Color: blue to clear liquid smell: irritant PH value: 3.0 boiling point: 100 °C Decomposition temperature: flash point: 90 °C Spontaneous combustion temperature: explosion limit: no limit	

Vapor pressure: same as water vapor density: heavier than air
Specific gravity: 1.0–1.03 (for water) solubility: completely soluble

十. 安全性及应性 Safety and response

安定性:在正常状况下是安定的.

特殊情况下可能之危害反应:

应避免之状况:接触不兼容的物质,暴露于直接日晒.

应避免之物质:强还原剂,强碱.

危害分解物:无

Stability: stable under normal conditions

Possible hazardous reactions under special circumstances:

Conditions to avoid: exposure to incompatible substances, direct sun exposure

Substances to be avoided: strong reducing agent, strong base

Hazardous decomposition products: None

十一. 毒性资料 Toxicity data

急毒性:1900mg/kg

局部效应:刺激

致敏感性:有

慢毒性或长期毒性:中等

特殊效应:无

Acute toxicity: 1900mg / kg

Local effect: stimulation

Sensitivity: Yes

Slow or long term toxicity: medium

Special effect: None

十二. 生态资料 Ecological data

可能之环境影响/环境流布:本产品为非挥发性但为水溶性物质并会被分隔为不同含水区间. 此产品难吸收在土壤或沉淀物之上. 但会被溶解到土壤中. 本产品会迅速溶于水中. 但会对水中生物产生危害。

Possible environmental impact / environmental distribution: This product is non-volatile but water-soluble and will be divided into

different water containing areas. This product is difficult to absorb on the soil or sediment, but it will be dissolved in the soil. This product will quickly dissolve in the water, but it will cause harm to aquatic organisms.

十三. 废弃处置方法 Waste disposal method

废弃得置方法:

废弃物处置:依据当地国家法规处置弃物及残留物. 此产品被评估具 RCRA 的物质, 但并不符合有害废弃物的标准, 若本品以购买时的形式补充丢弃, 依据 RCRA, 产品使用者有责任在丢弃时决定其是否符合 RCRA 有害废弃物的标准, 这是因为产品的使用, 转换, 混合, 处置等, 将可能使用成为有害物质。

废弃容器处置:在容器未被清洗干净前, 不可将标签去除. 空瓶可能仍含有有害之残留物需小心处理.

Disposal method:

Waste disposal: dispose of wastes and residues in accordance with local national regulations. This product is evaluated to have substances with RCRA, but it does not meet the standards of hazardous wastes. If this product is added and discarded in the form of purchase, according to RCRA, the user of the product is responsible for determining whether it meets the standards of RCRA hazardous wastes when it is discarded, because of the use, conversion, mixing, disposal, etc. of the product, will likely be used as a hazardous substance.

Disposal of waste container: do not remove the label before the container is cleaned. The empty bottle may still contain harmful residues which need to be handled carefully

十四. 运送资料 Shipping information

国际运送规定:

联合国编号:未分类

国内运送规定:

特殊运送方法及注意事项:

International Shipping Regulations:

UN No. : unclassified

Domestic delivery regulations:

Special delivery methods and precautions:

十五. 法规资料 Regulatory data

适用法规: 国标

Applicable regulations: National Standard

十六: 其它资料 Other information

公司名称	深圳市宝鑫化工技术有限公司	
制表人	职称:经理	姓名(签章): 吕平
制表日期:	2010/01/06	
Company name: shenzheng baoxinchemical technology co.ltd		
Preparer Title: manager name (seal): LV Ping		
Date of preparation: 2010 / 01 / 06		



Material Safety Data Sheet

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This material safety data sheet (MSDS) is provided as a courtesy in response to a customer request. This product is not regulated under, and a MSDS is not required for this product by the OSHA Hazard Communication Standard (29 CFR 1910.1200) because, when used as recommended or under ordinary conditions, it should not present a health and safety hazard. However, use or processing of the product not in accordance with the product's recommendations or not under ordinary conditions may affect the performance of the product and may present potential health and safety hazards.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M(TM) Laminating Adhesives 9471LE, 9472LE, 9671LE, 9672LE, 9653LE, 9453LE
MANUFACTURER: 3M
DIVISION: Industrial Adhesives and Tapes
ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 06/20/2003
Supersedes Date: 05/22/2001

Document Group: 08-9111-9

Product Use:
Specific Use: Laminating Adhesive

SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
TACKIFIED ACRYLATE POLYMER	None	100

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Roll of Tape
Odor, Color, Grade: Tan, Acrylate odor when unrolled.
General Physical Form: Solid

Immediate health, physical, and environmental hazards: This product, when used under reasonable conditions and in accordance with the 3M directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:

No health effects are expected.

Skin Contact:

No health effects are expected.

Inhalation:

No health effects are expected. This product may have a characteristic odor; however, no adverse health effects are anticipated.

Ingestion:

No health effects are expected.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: No need for first aid is anticipated.

Skin Contact: No need for first aid is anticipated.

Inhalation: No need for first aid is anticipated.

If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	No Data Available
Flash Point	Not Applicable
Flammable Limits - LEL	Not Applicable
Flammable Limits - UEL	Not Applicable

5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

Unusual Fire and Explosion Hazards: No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Not applicable.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Avoid prolonged or repeated skin contact. This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions.

7.2 STORAGE

Not applicable.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Not applicable.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact.

8.2.2 Skin Protection

Avoid prolonged or repeated skin contact. Gloves not normally required.

8.2.3 Respiratory Protection

Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection.

8.2.4 Prevention of Swallowing

Not applicable.

8.3 EXPOSURE GUIDELINES

None Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:

Odor, Color, Grade:

General Physical Form:

Autoignition temperature

Flash Point

Flammable Limits - LEL

Flammable Limits - UEL

Boiling point

Roll of Tape

Tan, Acrylate odor when unrolled.

Solid

No Data Available

Not Applicable

Not Applicable

Not Applicable

Not Applicable

Vapor Density	Not Applicable
Vapor Pressure	Not Applicable
Specific Gravity	Approximately 1.01 [Ref Std: WATER=1]
pH	Not Applicable
Melting point	No Data Available
Solubility in Water	Nil
Evaporation rate	Not Applicable
Volatile Organic Compounds	No Data Available
Percent volatile	No Data Available
VOC Less H2O & Exempt Solvents	No Data Available
Viscosity	Not Applicable

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: None known

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Hydrocarbons	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

Hazardous Decomposition: Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not applicable.

CHEMICAL FATE INFORMATION

Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of waste product in a sanitary landfill. As a disposal alternative, incinerate in an industrial or

commercial facility.

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - No Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 0 Flammability: 1 Reactivity: 0 Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Reason for Reissue: The MSDS has been revised because 3M has adopted the 16-section ANSI/ISO format. The potential hazards of the product have not changed. We encourage you to reread the MSDS and review the information.

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江阴凯博通信科技有限公司
JIANGYIN KAIBO COMMUNICATION TECHNOLOGY CO., LTD.
Material Safety Data Sheet (物质安全资料表)

一、 物品与厂商资料

物品名称：同轴高频线

物品编号：RF081 系列

制造商或供货商名称、地址：江阴市凯博通信科技有限公司/江苏省江阴市澄江镇梅园大街 391 号

紧急联络电话/传真电话：0510-86070001/86070020

二、 成分辨识资料

纯物质：

中英文名称：聚全氟乙丙烯 FLUORINATED PROPYLENE ETHYLENE/镀锡线 TINNED COPPER/镀银铜线
Cu-silver plated 同义名称：FEP/TX/SC

危害物质成分(成分百分比)：无

危害物质：

危害物质	浓度或浓度范围（单位：ppm）	
铅及其化合物 Pb	≤90	
镉及其化合物 Cd	≤75	
汞及其化合物 Hg	≤1000	
六价铬及化合物	≤1000	
卤素	氯 Cl≤900	氯 Cl+溴 Br≤1500
	溴 Br≤900	
SVHC15 种物质	禁止使用	

三、 危害辨识数据

最 重 要 危 害 效 应	健康危害效应：在 260℃ 以上，可能会有吸入分解气体的危险. 一定要安装排气装置.
	环境影响：要按废弃物处理及清扫法律法规处理, 绝对不可燃烧.
	物理性及化学性危害：物理化学性能及其稳定, 不易降解, 不得擅自填埋 .
	特殊危害： 无
主要症状： 对人的神经系统产生损害	
物品危害分类： 大气和水源	

四、 急救措施

不同暴露途径之急救方法：
· 吸入：到空气流通处换气.
· 皮肤接触：无
· 眼睛接触：无
· 食入： 不消化, 排出.
最重要症状及危害效应： 无

对急救人员之防护：对流换气
对医师之提示：吸氧

五、灭火措施

适用灭火剂：通用
灭火时可能遭遇之特殊危害：避免分解气体吸入
特殊灭火程序：无
消防人员之特殊防护设备：防毒面罩

六、泄漏处理方法

个人应注意事项：粉状树脂
环境注意事项：不可填埋
清理方法：要按废弃物处理及清扫法律法规处理, 绝对不可燃烧.

七、安全处置与储存方法

处置：避免与高温和火源接触.
储存：通风干燥处.

八、暴露预防措施

工程控制：无
控制参数： · 八小时日时量平均容许浓度/短时间时量平均容许浓度/最高容许浓度： · 生物指标：
个人防护设备： · 呼吸防护：安装排气装置 · 手部防护：无 · 眼睛防护：无 · 皮肤及身体防护：无
卫生措施：应将衣服上附着的灰尘抖落, 手脸洗净, 不要让其附着于香烟上.

九、物理及化学性质

物质状态：固体	形状：透明颗粒
颜色：透明	气味：无
pH 值：7	沸点/沸点范围：/
分解温度：360°C	闪火点：/
自燃温度：/	爆炸界限：/
蒸气压：/	蒸气密度：/
密度：2.2	溶解度：/

十、安定性及反应性

安定性：很稳定
特殊状况下可能之危害反应：高温或燃烧分解气体对人体神经系统的损害.
应避免之状况：绝对不可燃烧.
应避免之物质：金属钠及其强酸的混合物 .

危害分解物： 气体及粉尘.

十一、毒性资料

急毒性： /
局部效应： /
致敏感性： /
慢毒性或长期毒性： /
特殊效应： /

十二、生态资料

可能之环境影响/环境流布： 不降解, 禁填埋

十三、废弃处置方法

废弃处置方法： 按废弃物处理及清扫法律法规要求送专业资质处理公司处置.

十四、运送资料

国际运送规定： /
联合国编号： /
国内运送规定： 无
特殊运送方法及注意事项： 无

十五、法规资料

适用法规： 遵循欧盟 REACH 法规相关要求。

十六、其它数据

参考文献	杜邦产品说明/SONY 限用物资标准
制窗体位	名称： 江阴凯博通信科技有限公司
	地址/电话： 江阴市澄江街道梅园大街 391 号/0510-86070017
制 表 人	姓名(签章)： 庄科洁
制表日期	2012/11/12

化学品安全技术说明书

产品名称：聚对苯二甲酸丁二醇酯
修订日期：2016 年 11 月 09 日
最初编制日期：2014 年 02 月 10 日

按照 GB/T16483、GB/T 17519 编制
SDS 编号：2302-1
版本：3.1

第一部分 化学品及企业标识

化学品中文名称：聚对苯二甲酸丁二醇酯
化学品英文名称：Polybutylene terephthalate (PBT)
产品代码：DURANEX® 315NF EF2001
企业名称：WinTech Polymer 株式会社 (WinTech Polymer Ltd.)
企业地址：日本东京都港区港南 2 丁目 18 番 1 号，邮编：108-8280
(2-18-1 Konan, Minato-ku, Tokyo, 108-8280 Japan)
联系电话：+81-3-6711-8605 (质保部)
传 真：+81-3-6711-8616
应急咨询电话：+86-21-3256-8600 (宝理工程塑料贸易 (上海) 有限公司)
化学品推荐用途和限制用途：无资料

第二部分 危险性概述

紧急情况概述：

固体颗粒。

GHS危险性类别：

物理危害

易燃固体——不能分类
自燃固体——非此类
氧化性固体——不能分类
爆炸物——不能分类
自反应物质和混合物——不适用
自热物质和混合物——非此类
遇水放出易燃气体的物质和混合物——非此类
金属腐蚀物——非此类
有机过氧化物——不能分类

健康危害

急性毒性 (经口、经皮肤、吸入：蒸气、粉尘/烟雾) ——不能分类
急性毒性 (吸入：气体) ——不适用
皮肤腐蚀/刺激——不能分类
严重眼损伤/眼刺激——不能分类
呼吸道或皮肤致敏——不能分类
生殖细胞致突变性——不能分类
致癌性——非此类
生殖毒性——不能分类
特异性靶器官毒性——一次接触——不能分类
特异性靶器官毒性——反复接触——非此类
吸入危害——不能分类

环境危害

危害水生环境——急性危害——非此类
危害水生环境——长期危害——非此类
危害臭氧层——不能分类

标签要素：

象形图：无

信号词：无

危险性说明：无基于 GHS 的危险性说明。

防范说明：

预防措施：

- (1) 操作后彻底清洗。
- (2) 戴制造商、供应商或主管当局指定的防护手套。

安全储存：

- (1) 在阴凉、通风良好处储存。

废弃处置：

- (1) 按照地方/区域/国家/国际规章处置内装物/容器。

物理和化学危险：无资料

健康危害：干燥或熔化中产生的气体刺激皮肤和眼睛。

环境危害：无资料

其他危害：无资料

第三部分 成分/组成信息

纯品 ☐

混合物 ☒

组分	浓度或浓度范围 (质量分数, %)	CAS No.	EC No.
聚(氧代-1,4-亚丁基氧基羰基-1,4-亚苯基羰基) (别名：聚对苯二甲酸丁二醇酯) (PBT) (基体树脂) Poly(oxy-1,4-butanediylloxycarbonyl-1,4-phenylenecarbonyl) (Alias: Polybutylene terephthalate) (base resin))	≥58	24968-12-5	无
玻璃纤维 Glass fiber	15	无资料	无资料
磷系阻燃剂和其他 Phosphorus Flame retardant and others	≤27	无资料	无资料

注：本等级产品中不使用镉、铅、六价铬和汞。

第四部分 急救措施

急救：

吸入：如吸入熔融树脂产生的气体，尤其燃烧或加热产生的烟气，立即将患者移至空气新鲜处，直到患者恢复。如仍感觉不适，立即就医。

皮肤接触：如接触熔融树脂，立即用清水冲洗冷却，不要强行剥离。如皮肤上出现灼伤，立即就医。

眼睛接触：如接触熔融树脂，立即用清水小心地冲洗冷却15分钟以上。如戴隐形眼镜，立即取出隐形眼镜，并立即就医。如眼睛接触常温的聚合物固体，立即用清水小心地冲洗。如仍感觉不适，立即就医。

食入：误食后，尽量帮助催吐。如仍感觉不适，立即就医。

最重要的症状和健康影响：干燥或熔化中产生的气体刺激皮肤和眼睛。

对保护施救者的忠告：救援者需佩戴合适的防护设备。

对医生的特别提示：按症状治疗。根据患者的情况和事故的具体情况不同，治疗方法可能不同。在所有潜在的中毒情况下，现场应急救治是至关重要的。

第五部分 消防措施

适用灭火剂：泡沫、二氧化碳、化学干粉、水。

不适用灭火剂：无资料

特别危险性：不完全燃烧不仅会产生碳酸气体和水，还有一氧化碳、四氢呋喃等有毒气体。

灭火注意事项及防护措施：

消防人员必须穿戴气体面罩或其他防护设备，在上风向灭火，避免吸入有毒烟气。灭火时尽可能将容器从火场移至空旷处并对其进行冷却，也可通过雾状水来降低环境温度。尽快疏散下风向可能受影响人群。

火灾时，使用制造商/供应商或主管当局规定的适当的灭火剂。按一般火灾的灭火方法进行。不要对操作中的机器直接喷水。

隔离事故现场，禁止无关人员进入。

周边着火情况：安全情况下将容器搬离火场。在不可移动的状况下，使用适当的灭火剂对容器和包装进行灭火，并使用雾状水使其冷却。

着火情况：首先切断燃烧源，然后使用适当灭火剂从上风向灭火。

对消防污水进行回收处置。

第六部分 泄漏应急处理

人员防护措施、防护装备和应急处置程序：

处置人员在处置过程中应穿戴适当的防护装备，避免皮肤和眼睛接触，避免吸入粉尘。

事故处置完成后，应遵循严格的全身清洗程序。

保持泄漏区域的充分通风，移走一切点火源（包括非防爆型的电气设备）。大量泄漏情况下，疏散所有不必要的和无防护的人员至上风向安全区域。如产品残留在路面、地面上，可能引起滑跌，切勿接触或踩踏泄漏物。防止扬尘和粉尘积聚。

环境保护措施：切勿将本品冲入土壤、下水道、排水沟或其他任何水体。将所收集的泄漏物当作工业有害废弃物处置。

泄漏化学品的收容、清除方法及所使用的处置材料：

扫除或使用吸尘器收容泄漏物，并将其置于化学废弃容器中。用大量的水冲洗泄漏区域的残留泄漏物，并建议对清洗水进行回收处置。

水中泄漏：一旦本品意外地进入河流、湖泊或海洋，立即通知有关部门，并依照任何适用的法规来采取必要的措施。避免水生动物和鸟类摄取。

防止发生次生灾害的预防措施：处理后应彻底清洁受污染的地面。确保移走泄漏区域现场任何的点火源，并对现场进行充分地通风，以免二次事故的发生。

第七部分 操作处置与储存

操作处置：

安全处置注意事项和措施：操作应在通风良好区域进行，提供局部通排风系统，并注意定期（至少一年一次）调修设备。室内操作时需检测作业环境，确保能有效的改善环境。成型作业时，设置有效的局部通排风设备，排出熔融处理中产生的气体，避免吸入。搬运过程应防止容器泄漏；如产品残留在地面上，可能引起滑跌，应及时清理。室温下PBT颗粒状树脂不会燃烧或爆炸，但作业场所应消除一切点火源（包括非防爆型电气设备），操作过程中避免不必要的高温。不要将高温树脂滞留在加工机器中数小时，应及时清理。采取措施，预防静电危害。将粉尘源完全封闭。

尽量减少切割、研磨操作，设计尽量不产生粉尘的作业程序。杜绝野蛮操作或抛掷。玻璃纤维与路上的粉尘相似，对人体的危害很小，但需要采取适当的措施，避免无谓的吸入。将车间分区，避免玻璃纤维粉尘扩散。一般操作处理条件下玻璃纤维不会以单独物质的形式暴露，而是存在于混合颗粒中。但根据环境和操作条件，切割、接地或燃烧含玻璃纤维的颗粒或熔融部件时，应尽量减少玻璃纤维或含玻璃纤维的粉尘的暴露。皮肤对玻璃纤维过敏的工人应

穿合适的防护服，尽量减少皮肤暴露。操作人员应参考“第八部分”内容进行合适的个体防护，如防尘面罩、防护眼镜和手套，避免直接接触高温树脂和吸入粉尘。

作业场所禁止吸烟和饮食，作业完毕应立即脱掉受污染的衣着和防护装备，并沐浴、更衣，不要用手擦脸、颈部或胳膊。需注意不能在洗衣房清洗衣物，避免玻璃纤维污染洗衣房。

储存：

安全储存条件：储存于阴凉、干燥、通风良好的区域。避免阳光直射和高温。远离热源和引火源，严禁烟火。

安全技术措施：保持容器密封完好。

包装材料：无资料

第八部分 接触控制和个体防护

职业接触限值：

中国GBZ2.1-2007：玻璃棉粉尘：PC-TWA $3\text{mg}/\text{m}^3$ （总尘）。

美国ACGIH TLV（1992~1993）：粉末：TWA $10\text{mg}/\text{m}^3$ 。

美国OSHA PEL（1985）：惰性粉尘最大容许浓度 $15\text{mg}/\text{m}^3$ ；

同上（吸入性） $5\text{mg}/\text{m}^3$ 。

G1、G2B—国际癌症研究机构（IARC）的致癌性分级。

生物限值：无资料

监测方法：无资料

工程控制方法：切勿在不具有充分通风的区域使用本品。粉尘处理时使用完全封闭的容器，防止粉尘爆炸。成型加工中加热熔化时，必须提供有效的局部通排风设备。作业场所需提供安全淋浴和洗眼设备，并明确标识出来。受污染的工作服不得带出工作场所，清洗后方可重新使用。

个体防护装备：

呼吸系统防护：戴合适的防尘口罩。

眼面防护：戴合适的化学安全护目镜或防护眼镜。

皮肤和身体防护：处理熔融树脂时，穿合适的长袖防护服，防止灼伤。

手防护：处理熔融树脂时，戴合适的耐热手套，防止灼伤。

其他防护：作业过程中禁止吸烟、饮食。注意个人清洁卫生。如接触到或有疑虑，应立即求医治疗/咨询。作业完毕应遵循严格的全身清洗程序。

第九部分 理化特性

物态、形状和颜色：固体颗粒

气味：无资料

pH值：无资料

熔点/凝固点（℃）：224

沸点、初沸点和沸程（℃）：不适用

闪点（℃）： ≥ 300

燃点（℃）： ≥ 300

易燃性（固态、气态）：无

燃烧上下极限或爆炸极限（ g/m^3 ）：爆炸极限：上限：不适用 下限：35。

蒸气压（kPa）：不适用

蒸气密度：无资料

相对密度：1.45

溶解性：不溶于水，不与水发生反应。

n-辛醇/水分配系数：无资料

自燃温度（℃）：无资料

分解温度（℃）：无资料

升华点：无

氧化性：无
自反应性：无

第十部分 稳定性和反应性

稳定性：在正常的和推荐的操作、储存及处置条件下性质稳定。没有氧化性、自反应性、挥发性。

危险反应：无资料

应避免的条件：防止扬尘和粉尘积聚。

禁配物：无资料

危险的分解产物：四氢呋喃等。

第十一部分 毒理学信息

产品：

急性毒性：无资料

皮肤腐蚀/刺激：干燥或熔化中产生的气体刺激皮肤。

严重眼损伤/眼刺激：干燥或熔化中产生的气体刺激眼睛。

呼吸道或皮肤致敏：无资料

生殖细胞致突变性：无资料

致癌性：无资料

生殖毒性：无资料

特异性靶器官毒性——一次接触：无资料

特异性靶器官毒性——反复接触：无资料

吸入危害：无资料

毒代动力学、代谢和分布：无资料

其他：美国 OSHA 和 ACGIH 确定了粉尘的最大容许浓度和限值。

注：本报告中的“无资料”是指一般没有危害，但编写报告时没有证明资料。

填充剂玻璃纤维的危害信息：

皮肤影响：对人体：当玻璃纤维直径大于 4.5-5 μ m 时，玻璃纤维可能会导致皮肤的刺激。引起机械性刺激，导致皮肤发痒，但报告表明进一步反复接触，刺激症状却消失。有时可能导致过敏性皮炎伴随着症状复杂的荨麻疹或湿疹。但是报告提到，一般这种皮炎不严重，不会持续太长时间。因此正确使用玻璃纤维是可以预防对皮肤的刺激作用。

肿瘤影响：对人体：目前为止的玻璃纤维调查报告显示，玻璃纤维并未引起其生产工人因肺癌或间皮瘤而导致的死亡率的增加，也没有这样的病例报告。

动物试验报告：有人提出，矿物纤维的致癌性与其形状有关，而不是其成分。据美国国家癌症研究所 Dr.Stanton 研究编写的不同大小的 17 种人造矿物纤维的试验报告中，纤维的直径和长度与同时发生间皮瘤之间的相关性进行统计研究表明，矿物纤维有在直径小于 0.25 微米、长度大于 8 微米时，与同时发生癌症的密切度更大。由于这些试验是由人工对动物投加大量的玻璃纤维，因此，实际上与人体暴露的情况是完全不同的，仅由这些试验结果做出矿物纤维对人体健康有害的结论是不确定的。截至目前，没有实验结果可以证明长期暴露在高浓度的玻璃纤维中能够引起肺癌的机制。

第十二部分 生态学信息

生态毒性：无资料

持久性和降解性：无资料

潜在的生物累积性：无资料

土壤中的迁移性：无资料

其他环境有害影响：无资料

第十三部分 废弃处置

废弃化学品：必须依照当地和国家的法律法规进行处置。严禁将该产品倾倒入土壤、下水道、排水沟、地下水或任何水体中。建议采用焚烧法处置。建议采用配备后加力燃烧室和洗涤装置的化学焚烧炉进行焚烧处置。

污染包装物：残留有本品的所有容器或包装物也必须依照地方和国家的相关法律法规进行处置。空的容器会有产品残留，需彻底清空后按照相关说明处置。处置前彻底清空并清洗容器。处置作业人员的个体防护措施参见“第八部分”的内容。

废弃注意事项：如果委托专业废弃物处置机构进行处理，则需签订合同，并使其明确废弃物内容。如产品或其生产、使用等过程中产生的废弃物经判定属于危险废物的，需按照国家相关废弃物处置规定进行合理处置。

第十四部分 运输信息

联合国危险货物编号（UN 号）：无

联合国运输名称：无

联合国危险性分类：无

包装类别：无

海洋污染物（是/否）：否

运输注意事项：携带防护器具和灭火器。在运输装载之前，检查容器有无泄漏；确保平稳、安全装载，以防止容器滑动、坠落和损坏。运输过程中应采取合适的措施防止容器损坏。防止暴晒、雨淋、高温。防止受潮。虽然不属于危险货物，但运输中最好遵守 ICAO、IMDG、RID、ADR、ADN 相关规定。

第十五部分 法规信息

法规信息：

《危险化学品安全管理条例》（2011 年国务院 591 号令）针对危险化学品生产、储存、使用、经营和运输的安全管理作了相应规定。根据《化学品分类和危险性公示-通则》（GB13690-2009）、《危险货物物品名表》（GB12268-2012）、《危险化学品目录》（2015 版）、《危险货物分类和品名编号》（GB6944-2012）、《工作场所有害因素职业接触限值 第 1 部分：化学有害因素》（GBZ 2.1-2007）以及中国 GHS 相关国家分类标准对本品进行分类和辨识。

所有用户必须启用和遵照在本化学品安全技术说明书（SDS）以及国家安全生产监督管理总局（SAWS）、中华人民共和国环境保护部（MEP）、卫生部（MOH）、人力资源和社会保障部（MHR&SS）等部门发布的法规中指定的作业人员保护措施以及环境排放控制办法。

针对该产品的 HSE 管理规定（仅针对本品中的公开成分，对于本品中商业机密成分的相关规定请详询制造商或供应商）：

职业健康和劳动保护管理规定：

《防护服装化学防护服的选择、使用和维护》（GB/T24536-2009）：玻璃棉

环境管理规定：

《中国现有化学物质名录》（IECSC，2013 年版）：未保密成分已列入。

其他：

《建筑设计防火规范》（GB50016-2014）：丙类及以上的仓库。

第十六部分 其他信息

编写和修订信息：

本修订版 SDS 对全文 16 个部分的内容均进行了修订。

缩略语和首字母缩写：

PC-TWA：时间加权平均容许浓度（permissible concentration-time weighted average）。指以时间为权数规定的 8h 工作日、40h 工作周的平均容许接触浓度。

PC-STEL：短时间接触容许浓度（permissible concentration-short term exposure limit）。指在遵守 PC-TWA 前提下允许短时间（15min）接触的浓度。

TLV-TWA：阈限值时间加权平均浓度（ThresholdLimitValue- time weighted average）。

PEL：允许暴露限值（Permissible exposure limit）。

OSHA：美国职业安全与健康管理局（Occupational Safety and Health Administration）。

ACGIH：美国政府工业卫生学家会议（American Conference of Governmental Industrial Hygienists）。

免责声明：本 SDS 的信息仅适用于所指定的产品，除非特别指明，对于本产品与其他物质的混合物等情况不适用。本 SDS 只为那些受过适当专业训练的该产品的使用人员提供产品使用安全方面的资料。本 SDS 的使用者，在特殊的使用条件下必须对该 SDS 的适用性做出独立判断。在特殊的使用场合下，由于使用本 SDS 所导致的伤害，本 SDS 的编写者将不负任何责任。

本文件记载了产品的安全信息。关于质量保证上的必要条件请参照技术资料，规格说明书等。

如需更多的信息，请与WinTech Polymer株式会社（WinTech Polymer Ltd.）进行联系。

参考文献：

- 1) 《化学品安全技术说明书编写指南》（GB/T 17519-2013）
- 2) 《全球化学品统一分类和标签制度》（GHS）（ST/SG/AC.10/30）
- 3) 《基于 GHS 的化学品标签规范》（GB/T 22234-2008）
- 4) 《化学品安全技术说明书 内容和项目顺序》（GB/T 16483-2008）
- 5) 《化学品危险性评价通则》（GB/T22225-2008）
- 6) 《化学品安全标签编写规定》（GB15258-2009）
- 7) 《化学品分类和危险性公示-通则》（GB13690-2009）
- 8) 《汽车运输危险货物规则》（JT617-2004）

※DURANEX® 是宝理塑料株式会社在日本及其他国家持有的注册商标，WinTech Polymer 株式会社获许可使用该商标。

物质安全资料表

MSDS C5100,C5191,C5210,C5240

物质安全资料表编号：MCL001	改版日期：02-15-2015
版次：4	前次改版：02-20-2008

1. 物质供应商资料

物品中(英)文名称：	磷青铜(PHOSPHOR BRONZE ALLOYS)		
物品代码：	JIS C5100,C5191,C5210,C5240		
化学名称：	铜(Cu)-锡(Sn) 金属合金		
类别：	铜金属合金		
制造商或供应商名称：	福建紫金铜业有限公司		
制造商或供应商地址：	福建省龙岩市上杭县南岗开发区		
制造商或供应商电话：	0597-3960633	传真：	0597-3833128
制造商或供应商网址：	www.fjzjty.com		
紧急联络电话：	0597-3960600		

2. 成品成分

C5100	CAS编号	化学名称	重量比例%
	7440-50-8	铜(Cu)	>93.65
	7440-31-5	锡(Sn)	4.5~5.5
	7723-14-0	磷(P)	0.03~0.35

C5191	CAS编号	化学名称	重量比例%
	7440-50-8	铜(Cu)	>92.15
	7440-31-5	锡(Sn)	5.5~7.0
	7723-14-0	磷(P)	0.03~0.35

C5210	CAS编号	化学名称	重量比例%
	7440-50-8	铜(Cu)	>90.0
	7440-31-5	锡(Sn)	7.0~9.0
	7723-14-0	磷(P)	0.03~0.35
	7440-66-6	锌(Zn)	<0.20
	7439-92-1	铅(Pb)	<0.05
	7439-89-6	铁(Fe)	<0.10

C5240	CAS编号	化学名称	重量比例%
	7440-50-8	铜(Cu)	>90.15
	7440-31-5	锡(Sn)	9~11
	7723-14-0	磷(P)	0.03~0.35

OSHA 管理状态：在固体时不具危害性。其粉尘及烟对肺脏、血液、肾脏具有致癌、刺激性。反复产生之毒性及神经性毒素

OHSA：本合金产品在固体时不具危害性。其粉尘及烟具有危害性。

(美国) 职业安全卫生署 OSHA

3. 危害辨识资料

警告！ 暴露于粉尘及烟的工作环境下，对于眼睛、呼吸系统、皮肤会造成刺激伤害。其含有金属可能对血液、肾脏产生反复性及神经性之影响，也可能致癌。必须保持足够且良好之通风。避免直接接触眼睛、皮肤及衣物。佩戴保护器具，包括护目镜、适当衣物，必须要保证全部身体。身体及衣物被接触之部位，必须彻底清洗干净。	
种类的名称：	铜、锡之金属混合物。
危险标识类别：	金属粉尘或烟将对皮肤、眼睛造成刺激性且对肺具有毒性，但金属合金本身不具危害性。
HMIS 危害级数（粉尘及烟）：	健康：2；可燃性：0（0=低、4=极高）； 物性危害：无
IDLH 对生命或健康有立即性危害浓度值	IDLH(3/1/95)无本金属立即性危险浓度数值。 铜(Cu)粉尘或烟、铅(Pb)、锡(Sn)：100 mg / m ³ 磷(P)：5 mg/m ³ 氧化铁(Fe)粉尘或烟：2500 mg / m ³ 氧化锌：500 mg / m ³

Hazardous Materials Identification System (HMIS)

严重症状：

眼睛：其粉尘或烟皆具刺激性，会引起红肿及疼痛。经常暴露于此环境时，可能导致结膜炎。

皮肤：此物质不会经由皮肤渗入体内被吸收。但接触其粉尘时，皮肤有可能会引起轻微刺激而出现红肿现象。

吸入：吸入人体是有害的。吸入高浓度粉尘或烟可能会导致剧烈呼吸、鼻刺激、咳嗽、呼吸困难。吸入高浓度铜金属粉尘或烟也可能出现呕心、呕吐及胃痛现象。金属烟可能引起类似流行性感（flu-like）症状之金属烟热；其症状包括喉咙不适、呼吸困难、咳嗽、哮喘、呕吐、头痛、发冷、发热、肌痛、虚弱、昏睡、流汗、关节痛。这些症状通常会在24小时后消失，但也有可能更长时间。

食入：大量食入粉尘时，可能引起呕心、腹泻及胃痛现象。

慢性影响：皮肤长期或者重复性接触其粉尘时可能引起剧烈刺激或皮肤炎。长期或者重复性吸入其粉尘或烟会导致更剧烈刺激。慢性暴露于铅中会引起人体肾脏损害、贫血症、复发性及成长性影响、永久性神经系统损害。

4. 急救措施

对于粉尘及烟危害：

眼睛接触：	以大量清净水冲洗上下眼睛内部（至少15分钟），若眼睛被刺激不适者，立即送医院检查
皮肤接触：	以清水清洗干净。衣物被接触之部位，必须彻底清洗干净后才能再穿戴。若仍有皮肤发生刺激、出疹现象或情况持续、复发时送至医院诊疗。
吸入时：	送至通风良好较阴凉处休息，以毛巾保暖，严重者迅速送医院检查诊断。
食入时：	大量喝水并催吐，迅速送医院检查

医疗提示：对于本产品组成之元素物质并无特殊解毒剂可供使用。必须视不同症状给予适当治疗。

5. 火灾及爆炸危害资料

燃烧性资料：

爆炸性：	无
可燃性：	无
燃烧性：	无
闪火点：	不适用
自燃性：	不适用

灭火剂：

小区域之材料粉末起火时，可适用干沙、干石灰粉、食盐或苏打粉给予关熄。其他周边处起火时需以适当灭火器灭火。

意外及爆炸危害：

注意粉尘可能导致爆炸或产生可燃性气体。

6. 泄露的处置

本产品在加工中产生粉尘时，有可能产生爆炸危害，必须将火源移除。也惟有粉尘型态时才可能产生泄露，所以必须装设通风设备及集尘装置过滤空气中之粉尘，以降低其粉尘浓度。

7. 取用及储运方式

取用注意事项：

板带产品之端面易割伤皮肤应小心取用。
切削加工时会产生粉尘应小心眼睛、皮肤及呼吸应佩戴保护器具。
小心粉尘不可泄露至空气中。
需注意产品有翻到之危险性易造成压伤，吊运时要十分注意。
打包带切除时，小心其末端会弹起，对人员之身体、皮肤及眼睛造成割伤。
衣物或器具上之粉尘以水洗或HEPA吸入器清淘，不可用拍打或其他方式处理。

储存条件：

食储最高容许温度：无

避免放置于潮湿或酸/碱性物质或酸/碱性气体之场所

8. 人员暴露防设措施

CAS 编号	暴露标准：	OSHA(PEL)	ACGIH(TLV)
铜(Cu) 7440-50-8	烟烟	0.1 mg/m ³	0.2 mg/m ³
	粉尘及雾状	1 mg/m ³	1 mg/m ³
锡(Sn) 7440-31-5	粉状	2 mg/m ³	2 mg/m ³
磷(P) 7723-14-0	-	0.1 mg/m ³	0.1 mg/m ³
锌(Zn) 7440-66-6	-	无资料	无资料
铅(Pb) 7439-92-1	粉尘及烟烟	0.05 mg/m ³	0.05 mg/m ³
铁(Fe) 7439-89-6	-	无资料	无资料

本产品材料若经加热会产生烟烟，氧化锌烟烟可能形成。

OSHA(PEL)以及 ACGIH(TLV)对氧化锌烟烟之限制值为 5 mg/m³

呼吸防设：	一般情况下不需佩戴口罩。但当超过上述PEL/TLV标准值时必须佩戴NIOSH认证之全罩或半罩式HEPA滤心防口罩。
通风防设：	工作场所中，若是会产生烟烟及粉尘时，必须要有通风设备装置及集尘装置，且工作中不可饮食及抽烟
眼睛及脸部防设：	需要佩戴护目镜。
皮肤防设：	作业时应穿着适当之工作服，安全鞋及防护手套，以避免皮肤与材料直接接触并防止割伤。

(美国) 职业安全卫生署OSHA(Occupational Safety and Health Administration)

(美国) 国家职业安全卫生研究所NIOSH(National Institute for Occupational Safety and Health)

立即对生命或健康有危险 IDLH(Immediately Dangerous to Life or Health)

时量平均浓度TWA(Time Weighted Average)：

容许暴露浓度值 PEL(Permissible Exposure Limit)

9. 物理及化学性质

外观：	浅红色光泽的固态金属
熔点：	C5100(950~1060℃),C5191(900~1045℃), C5210(870~1030℃),C5240(840~1020℃)
沸点：	无资料
比重：	C5100(8.86),C5191(8.83), C5210(8.80),C5240(8.7)
蒸气压：	不适用
溶解度：	不适用
PH 值 25℃：	不适用

10. 稳定性及活性资料

稳定性	在正常一般室温及大气下为稳定性物质，非活性物质。
应避免之状况	遭受机械撞击或通电时并不会产生化性反应。
应避免之材料	氯：与金属黄铜、铜细分应形成剧烈或爆炸性反应。 乙炔：与黄铜形成爆炸性化合物。
危害之分解物	当加热至分解温度时，会产生金属氧化物和金属烟。有可能引起类似流行性感冒（flu-like）症状之金属烟热。
危害之聚合反应	无。

11. 毒性资料

潜在之暴露途径：

粉尘：食入、皮肤接触、吸入、眼睛接触。

烟：吸入、眼睛接触。

本合金产品不具毒性。

动物急毒性资料：动物半致死剂量 (LD₅₀)及浓度(LC₅₀)

针对本合金产品之粉尘或烟	铜 (Cu)	锡 (Sn)	磷 (P)	锌 (Zn)	铅 (Pb)	铁 (Fe)
口服 (LD ₅₀)	3.5mg/Kg(鼠，腹腔内)	无资料	无资料	无资料	无资料	30mg/Kg(鼠)
皮肤 (LD ₅₀)	375mg/Kg(兔，皮下注射)	无资料	无资料	无资料	无资料	无资料
吸入 (LC ₅₀)	无资料	无资料	无资料	无资料	无资料	无资料

亚慢性及慢性毒性：本合金产品不具毒性。铅对实验室中动物之血液、肾脏及神经系统会造成损害。

致癌性：本合金产品尚未被报告具致癌性。铅被 IARC(International Agency for Research on Cancer) 列入对人头可能致癌，属2B类

致基因突变型：本合金产品尚未被报告具致基因突变性。铅则在数项细胞体外试验中显示有致基因突变性。

复发性及成长性影响：本合金产品不具复发性及成长性影响。铅会导致实验室中动物之脱臼发育，包括天生畸形缺陷及影响雄性生殖能力。

神经性影响：本合金产品尚未被报告具有神经性影响。铅会导致实验室中动物之中枢、末梢神经系统损伤及行为影响。

12. 生态资料

本合金产品对生态之毒性：无资料

其单一成分之毒性说明如下：

生态毒性 ecotoxicity：水中的溶解度，在 0.1~1.0mg/l 范围内已被许多研究者证实对大多数鱼类不具有毒性。但浓度在 0.015-3.0mg/l 时，尤其在软水中，会有报告会对许多种类的鱼、甲头类的动物及软体动物、浮游生物具有毒性。
铅对大翻车鱼(Bluegill)/蓝思鱼(Lepomis macrochirus)LC₅₀(48Hrs)资料为 2~5mg/l。铅对水鸟类皆具毒性。

流动性：分解的铅会对转移入土壤内。

持续性/可分解性：铅在环境中会持续且累积。

生态累积性 (Bioaccumulation): 无资料。

13. 废弃处理

本合金产品不属于危害性废弃物：须丢弃时可以委托当地回收商予以回收再生利用。

14. 运输资料

USA DOT：未被列入。

运输时本产品不要直接与水接触，并且要注意会滑落、翻落得危险发生

15. 法规资料

通常无特定法令规定，但是在会产生粉尘的场所必须遵守劳工安全卫生法劳工作业环境空气中有害物质容许浓度标准

USA/OHSA：Occupational Safety & Health Administration

USA/ACGIH Guide to protective Clothing. Cincinnati, OH: American Conference of Government Industrial Hygienists, 1987

USA/SARA313

16. 其他资料

初版：04-28-2008

制表单位：福建紫金铜业有限公司

注意：本MSDS内容资料应被所有使用、运送、储存或暴露于本合金产品之公司/人员

充分了解并接受并将其应用于使用、加工、制造或管理与本合金产品有关之相关作业规定上；使用者请依应用需求，自行判断其可用性。本MSDS资料内容在编订时已经可能将最新之资料纳入，但对所有内容并不予以任何保证。

物质安全资料表 Material Safety Data Sheet (MSDS)

电镀金层

Gold Plating

一、 外观：表面金黄色，无污染物。

Appearance: Golden surface & no contaminants.

二、 标 示：参照欧盟 ROHS无铅规格之规范提示。

Symbol: Refer to EU ROHS Lead-free Specification

三、 特性：光亮均匀 。

Characteristic: bright & uniform.

四、 用途：提高基材焊接性能、防护性、耐磨性，降低接触阻抗。

Purpose: Improve the weldability, protection and wear resistance of the base metal, and reduce the contact impedance.

五、 规 格：符合欧盟ROHS要求。

SPEC: Conform to EU ROHS requirements

六、 物理性质PHYSICAL PROPERTIES:

(1) 液相温度：约1064℃。

LIQUIDUS TEMPERATURE: About 1064℃

(2) 比重：17.6 g/cm³(25℃)。

SPECIFIC GRAVITY: 17.6 g/cm³(25℃)

物质安全资料表 Material Safety Data Sheet (MSDS)

七、 物品与厂商资料 Items and Manufacturer information

物品名称：无铅电镀金层 Item Name: Lead-free gold plating			
物品编号：KSYTAu-001 Item No:			
制造厂商： 翊腾电子科技（昆山）有限公司 Manufacturer: YTOP Electronic Technology (Kunshan) Co.,Ltd.			
制作部门：PBU工程部 Prepared Dept.: Engineering Dept PBU	制作日期：2013.05.14 Prepared Date:	版本 Revision No.	V1.4
文件编号：YT-MSDS-AU File No.:	修改日期：2022-6-8 Revised Date:	有效期 Validity period	3年 3 years
联络电话： Tel: +86-512-55101900 Fax: +86-512-55101905			

八、 主要成份资料 Main Composition:

中（英）文名称 Chinese (English) Name	化学式 Chemical formula	含量(WT%) Content(WT%)	化学文摘社登记号码 (CAS NO)
金 (Gold)	Au	>99.7	7440-57-5
钴 (Cobalt)	Co	0.15-0.3	7440-48-4

九、 危害性资料 Harmfulness Information:

本产品是根据在欧盟立法之WEEE及ROHS要求、美国环保局（ENA）禁止使用铅和镉（及其衍生物）之相关规定而开发之环保产品，电镀层合金成份中含铅量（其产品中关键之两个参数之一,Wt%）≤90PPM。此项要求能保证不对人体及环保产生直接性危害，故其危害性并无更深入之资料。

This green product is developed in accordance with the requirements of WEEE and ROHS in EU legislation and the relevant regulations of ENA prohibiting the use of lead and cadmium (and its derivatives). Lead content (Wt%) of electroplated alloy composition, one of two key

物质安全资料表 Material Safety Data Sheet (MSDS)

parameters of this product, is $\leq 90\text{PPM}$. This requirement can ensure that there is no direct harm to human and environmental protection. Therefore, there is no more in-depth information on its harmfulness..

十、 急救措施 First-aid Measures

使用过程中如遇下列情况，请根据相应之指引进行处理：

If you encounter the following situations in the course of use, please deal with them according to the corresponding guidelines:

*吸入：将患者移至有清新空气处；如果患者已停止呼吸，则施以人工呼吸，送急诊。

Inhalation: Move the patient to a place with fresh air. If the patient has stopped breathing, apply artificial breathing and send to the emergency department.

*皮肤接触： /

Skin Contact

*眼睛接触：以大量的清水冲洗15 分钟或者直到刺激感消失。如果刺激感仍存在，则去医院救治。

Eye Contact: Rinse with plenty of water for 15 minutes or until irritation disappears. If irritation still exists, go to the hospital for treatment.

*食入：不催吐（除非医疗人员指示）；如果患者仍有意识且清醒，立即送诊。

Ingestion: Do not use emetic method (unless directed by a medical worker). If the patient is still conscious and awake, see the doctor immediately.

最重要症状及急害效应：人体吸入金属粉末而超标导致神志不清。

Most Important Symptoms and Emergency Effects: Excessive inhalation of metal powder leads to unconsciousness.

对急救人员之防护：无

Protection for First-Aid Personal: No

对医师之提示：无

Tips to Doctors : No

十一、 灭火措施 Fire Extinguishing Measures

适用灭火剂：水、泡沫、干粉及二氧化碳灭火剂。

Suitable extinguishing agent: Water, foam, dry powder and carbon dioxide fire extinguishing agent

灭火时可能遇到之特殊危害：无相关资料可看。

Special hazards that may be encountered when extinguishing fire: No relevant information available.

特殊灭火程序：不适用。

Special Fire Fighting Procedures: N/A

消防人员之特殊防护设备：氧气筒及防护衣。

Special protective equipment for firefighters: Oxygen cylinder and protective clothing

十二、 泄露处理方法 Leakage Disposal Method

物质安全资料表 Material Safety Data Sheet (MSDS)

个人应注意事项：佩戴口罩并按规范要求进行作业（注意高温且有腐蚀性）。 Personal Attentions: Wear masks and work according to specifications (pay attention to high temperature and corrosiveness).
环境注意事项：勿使泄露面积扩大。 Environmental considerations: Do not widen the leak area.
清理方法：通风并清扫 Cleaning method: Ventilating and cleaning

十三、安全处置与储存方法 Safe disposal and storage methods

处置 Disposal: *阅读所有的容器标示。 Read all container labels. *工作场所内禁吃东西、喝饮料、抽烟及化妆。 No eating, drinking, smoking and makeup is allowed in the workplace. *使用完毕，操作者应用肥皂清洁双手。 After use, the operator needs to clean hands with soap.
储存： 避免高温及接触氧化剂、酸与过氧化氢等化学品。 Storage: Avoid high temperature and avoid contact with chemicals such as oxidants, acids and hydrogen peroxide.

十四、暴露预防措施 Exposure preventive measures

工程控制： 提供足够的机械式排气装置。 Engineering Controls: Provide enough mechanical exhaust devices.				
容许浓度Permissible concentration			生物指标Biological indicators	
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)	LD50 (测试动物、吸收途径)	LC50 (测试动物、吸收途径)
/	/	/	/.	/
个人防护设备Personal protective equipment: / 呼吸防护Respiratory protection: *一般使用：配戴口罩。 General use: Wear a mask. *紧急状态防护：粉尘或烟雾超过容许浓度时，应穿戴防粉尘、防烟雾的防毒面具。 Emergency protection : When dust or smoke exceeds the allowable concentration, gas masks should be worn to prevent dust and smoke. *眼睛防护：配戴安全眼镜及/或面罩（当有粉尘飘散或金属喷溅时）。 Eye protection: Wear safety glasses and/or masks (when dust or metal splashes are present).				

物质安全资料表 Material Safety Data Sheet (MSDS)

十五、 物理及化学资料 Physical and chemical data

物质状态：固体 Material state: Solid	PH 值：不适用 PH Value: N/A
形状：/ Shape: /	颜色：金黄色 Color: Golden
分子量：不适用 Molecular weight: N/A	熔点：1064 °C Melting point: 1064 °C
沸点：不适用 Boiling point: N/A	闪火点：不适用 Flash point: N/A
分解温度：/ Decomposition temperature: /	爆炸界限：不适用 Explosion boundaries: N/A
自然温度：不适用 Natural temperature: N/A	气味：无气味 Smell: Odorless
蒸气比重：（空气=1）：不适用 Vapor density: N/A	蒸汽压：不适用 Vapor pressure: N/A
密度：17.6 g/cm ³ Density: 17.6 g/cm ³	水中溶解度：不溶于水 Solubility in water: Insoluble in water

十六、 安定性及反应性 Stability and reactivity

安定性 Stability	安定Stable	适用 Applicable	特殊状况下可能之危害反应 Possible Harmful Reactions under Special Conditions	无 No
	不安定Unstable	不适用N/A		
危害分解物：无 Hazardous decomposition: None				
应避免之状况：高温。 Conditions to avoid: High temperature.				
应避免之物质：与酸、过氧化氢（H ₂ O ₂ ）等强酸性及强氧化性物质接触。 Substances that should be avoided: Contact with strong acidic and oxidizing substances such as acid and hydrogen peroxide（H ₂ O ₂ ）.				

十七、 毒性资料TOXICOLOGICAL INFORMATION:

（本项无法取得相关资料）--NIF（No Information Found）

急毒性Acute toxicity:
局部效应Partial effect:
致敏效应Sensitization effect:
慢毒性或长期毒性Chronic or long-term toxicity:

物质安全资料表 Material Safety Data Sheet (MSDS)

特殊效应Special effect:

12.运送资料 Transport Information

国际运送规定International Transport Regulations:

INTERNATIONAL MATERIAL DANGEROUS GOODS CODE LABEL

USA DOT SHIPPING LABEL:

DOT SHIPPING NAME:NON-HAZARDOUS MATERIAL

联合国编号：不适用

United Nations Number: N/A

国内运送规定：除依据操作及保管上应注意事项外，亦遵照有关铅中毒预防规则之注意事项。

Domestic transport regulations: In addition to matters needing attention in operation and storage, attention should also be paid to the regulations for the prevention of lead poisoning.

特殊运送方法及注意事项：无

Special transportation methods and matters needing attention: No

13. 法规资料 Regulation Data

劳动安全卫生法、废弃物清理法相关无铅环保法规

Labor Safety and Health Law, Waste Cleaning Law and Lead-free Environmental Protection Regulations

14、生态资料 Ecological data

可能之环境影响/环境分布：不需特别注意。

Possible environmental impact/distribution: No special attention is required.

15、废弃处置方法 Waste Disposal methods

废弃处置方法：属无害事业废弃物，在掩埋前先行固化

Waste disposal methods: It belongs to harmless industrial waste and solidifies before burying.

16、其它资料 Other data :

无 No



物质安全资料表 MSDS

电镀镍层

1. 物品与厂商资料

物品名称：无铅电镀镍层			
物品编号：KSYTNi-001			
制造厂商：翊腾电子科技（昆山）有限公司			
制作部门：PBU工程部	制作日期： 2013.05.14	版本	V1.5
文件编号：YT-MSDS-NI	修改日期： 2019.8.26	有限期	3年
联络电话： Tell：0512-55101900 Fax：0512-55101905			

2. 主要成份资料

中（英）文名称	化学式	含量(WT%)	化学文摘社登记编号 (CAS NO)
镍 (Nickel)	Ni	99.7	7440-02-0
硫 (Sulfur)	S	≤0.01	63705-05-5
碳 (Carbon)	C	≤0.01	7440-44-0
铜 (Copper)	Cu	≤0.03	7440-50-8

3. 危害性资料：

本产品是根据在欧盟立法之 WEEE 及 ROHS 要求、美国环保局（EPA）禁止使用铅和镉（及其衍生物）之相关规定而开发之环保产品。其产品中关键

之两个参数，电镀层合金成份中含铅量（Wt%） ≤ 90 PPM。此项要求均能保证不对人体及环保产生直接性危害，故其危害性并无更深入之资料。

4. 急救措施

使用过程中如遇下列情况，请根据相应之指引进行处理：

- *吸入：将患者移至清新空气；如果患者已停止呼吸，则施以人工呼吸，送急诊。
- *皮肤接触：以大量的清水冲洗，如可能时使用肥皂。如果刺激感仍存在，则寻求医疗看护。
- *眼睛接触：以大量的清水冲洗，15 分钟或者直到刺激感消失。如果，刺激感仍存在，则寻求医疗看护。
- *食入：不催吐（除非医疗人员指示）；如果，患者仍有意识且清醒，立即送诊。

最重要症状及急害效应：人体吸入金属粉末而超标导致神志不清。

对急救人员之防护：无

对医师之提示：无

5. 灭火措施

不适用

6. 泄露处理方法

个人应注意事项：通风时作业，避免吸入灰尘，避免重复皮肤接触，穿合适的手套。

环境注意事项：含镍废料通常是收集恢复镍价值。废物处置应是必要时，按照有关的政府规章

清理方法：/

7. 安全处置与储存方法

处置：

阅读所有的容器标示。

*工作场所内禁吃东西、喝饮料、抽烟及化妆。

*使用完毕，操作者应用肥皂清洁双手。

储存：避免高温；接触氧化剂、酸与过氧化氢等化学品。

8. 暴露预防措施

工程控制：提供足够的机械式排气装置。

容许浓度			生物指标	
时量平均容许浓度 (TWA)	短时间时量 平均容许浓 度	最高容 许浓 度 (Ceiling)	LD50 (测试 动物吸收 途径)	LC50 (测试 动物吸收途 径)
/	/	/	/	/

个人防护设备：/

呼吸防护：

*一般使用：配戴口罩。

*紧急状态值：粉尘或烟雾超过容许浓度时，应翻戴防粉尘主烟雾的防毒面具。

*眼睛防护：配戴安全眼镜及/或面单（当有粉尘飘散或金属喷溅是时）。

9. 物理及化学资料

物质状态：固体	PH 值：不适用
形状：/	颜色：银白色
分子量：不适用	熔点：1453℃
沸点：不适用	闪火点：不适用
分解温度：2732℃	爆炸界限：不适用，但镍能与酸反应解放氢气可形成爆炸性混合物在空气中



自然温度：不适用	气味：无气味
蒸气比重：（空气=1）：不适用	蒸汽压：不适用
密度：9.0g/cm ³	水中溶解度：不溶解于水

10. 安定性及反应性

安定性	安定	适用	特殊状况下 可能之危害 反应	无
	不安定	不适用		
危害分解物： 无				
应避免之状况：高温。				
应避免之物质：与酸、过氧化氢（H ₂ O ₂ ）等强酸性及强氧化性物质接触，镍能与酸反应解放氢气可形成爆炸性混合物在空气中。				

11. 毒性资料：--NLF

*吸入：

美国国家毒理学计划已把镍当作可致癌物质来注射部位肿瘤。国际研究机构癌症（国际癌症研究机构）发现金属镍对人类致癌是证据不足的，但因为有足够的证据证明它不会致癌动物，国际癌症研究机构得出结论认为，金属镍可能致癌人类。

1997 年，镍元素 ACGIH 归类为：第 5 条“不涉嫌为人类致癌物质”。流行病学研究接触工人镍粉或尘埃和烟生产中产生的镍合金及不锈钢都没有表明存在显著呼吸癌症的危险。 吸入镍可引起哮喘。

*皮肤接触：

长期和亲密接触可能会导致金属镍刺激皮肤和镍敏感性可能导致过敏性皮疹。

*眼睛接触：

对于啮齿动物，从含镍假肢研究发现并没有表明对人类的重大风险。

*食入：

美国国立职业安全与健康（NIOSH）的结论，没有证据表明镍及其无

机化合物是致癌物质的。

12. 运送资料

国际运送规定：INTERNATIONAL MARITIME' DANGEROUS GOODS CODE LABEL

美国 DOT SHIPPING LABEL: DOT SHIPPING

NAME: NON-HAZARDOUS MATERIAL

联合国编号：不适用

国内运送规定：除依据操作及保管上应注意事项外，亦遵照有关铅中毒预防规则之注意事项

13. 法规资料

劳动安全卫生法、废弃物清理法相关无铅环保法规。

14. 生态资料

可能之环境影响/环境分布：不需特别注意。

15. 废弃处置方法

废弃处置方法：属无害事业废弃物，在掩埋前先行固化

16. 其他资料

参 考 文 献	1、危害化学物质中中文资料库，环保署
	2、RTECS 资料库，TOMESPLUS 光碟，V01.34, 1997
	3、HSDB 资料库，TOMESPLUS 光碟，V01.34, 1997
	4、IRIS 资料库，美国环境保护署