SDS (Safety Data Sheet)
安全資料表

一、Product and Company information 物品與廠商資料

Product names 物品名稱	無鉛焊錫球 (SAC405) Lead-Free Solder Sphere (SAC405)
Other Names 其他名稱	-----
Recommended use and restrictions on use 建議用途及限制使用	半導體工程 Semiconductor Engineering
Product Name 製造商或供應商	恆碩科技股份有限公司 ACCURUS SCIENTIFIC CO., LTD.
Address 地址	中華民國台灣 717 台南市仁德區文賢路一段 508~51 號 No.508-51, Section 1, Wen-Sien Road, Rende District, Tainan City 717, Taiwan (R.O.C.)
Telephone 電話	06-3661288 +886-6-3661288
Fax Number 傳真	06-2660474 +886-6-2660474
Emergency Telephone 緊急聯絡電話	06-3661288 +886-6-3661288

二、Hazards identification information 危害辨識資料

Hazard classification of the product 物品危害分類：
健康危害-特定標的器官系統毒性物質-重複暴露-二級。
Specific target organ systemic toxicity following repeated exposure. (Hazard category 2)

Label content標示內容

Label Format: Health Hazards
象徵符號：健康危害
Signal words: Warning
警示語：警告
Hazard statements: May cause damage to organ.
危害警告訊息：長期或重複暴露可能對器官造成傷害。
Precautionary statements:危害防範措施：
1. 如遇意外或覺得不適，立即洽詢醫療。
Get medical attention/advice if you feel unwell.
2. 使用本產品時，不得吃東西、喝水或抽菸。
Do not eat, drink or smoke when using this product.
3. 處置後徹底清洗雙手。
Wash hands thoroughly after handling.

Other hazards其他危害：-----

三、Ingredients identification information 成分辨識資料

□ Pure material 純物質 ■ Mixture 混合物

Chemical property 化學性質		
Chinese and English names of The hazardous ingredients 危害物質成分之中英文名稱	Concentration or concentration ranges (% of contents) 濃度或濃度範圍(成分百分比)	CAS No.
錫/Tin	95-96	07440-31-5
銀/Silver	3.8-4.2	07440-22-4
銅/Copper	0.3-0.7	07440-50-8

四、First-aid Measures 急救措施

The first-aid measures for different exposure routes 不同暴露途徑之急救方法	
Inhalation 吸入	1. 立即將患者移至新鮮空氣處並依需要維持其呼吸暢通。 Immediately move the patient to the ventilation and hold his breathing unimpeded. 2. 若呼吸停止，施予人工呼吸。 Offering the artificial respiration if patient stop breathing or dyspnea. 3. 保持患者溫暖及休息。 Keep the patient warm and rest. 4. 立即就醫。 Seek medical advice immediately.
skin contact 皮膚接觸	1. 以大量的清水沖洗。 Use considerable water to wash. 2. 沖掉沾染的化學品再立即用肥皂及水清洗皮膚。 The chemicals washed out and use the soap and water wash the skin. 3. 如仍有刺激感，立即就醫。 If still have sense of stimulating, Please seek medical advice immediately.
eye contact 眼睛接觸	1. 勿讓患者搓揉眼睛或緊閉眼睛。 Don't let the patient knead or close the eyes. 2. 小心地撐開眼皮並立即沖洗，連續沖洗至就醫為止。 Carefully open the eyelid and use water wash, Continuously wash it to seeking medical advice. 3. 儘速就醫。 Seek medical advice immediately.
Ingestion 食入	1. 勿餵食任何東西及催吐（除非醫療人員指示）。 Don’t queasy and feed the food (Unless medical instructions of personnel). 2. 立即就醫。 Seek medical advice immediately.
The most important symptoms and hazardous effects 最重要症狀及危害效應	1. 銀中毒、銅中毒及末梢神經疾病。 silver poison、copper poison and nerve ending illness. 2. 刺激感及過量吸入熱蒸氣會造成肺水腫。 Excitement and excessive inhale hot vapor can cause lung edema.
The protection of first-aiders 對急救人員之防護	應配戴防毒面罩或氧氣筒及防護衣。 Must wear the gas masks or oxygen mask and protective clothing.
Notes to physicians 對醫師之提示	1. 患者吞食時，考慮洗胃。 The patient considers gastric lavage when eating. 2. 銀及其無機化合物為神經毒物，可能引起末梢神經疾病。 Silver and inorganic compound is the neural poisonous substance, can cause nerve ending disease.

五、Fire Fighting Measures 滅火措施

Fire-fighting measures 適用滅火劑	水、泡沫、乾粉及二氧化碳滅火劑。 Water, Foam, Powder and CO2 extinguisher.
Suitable fire extinguishing media 滅火時可能遭遇之特殊危害	無相關資料可查。 No relevant information for inquiring.

Specific hazards may be encountered during fire-fighting 特殊滅火程序	不適用。 Not application.
Specific fire-fighting methods 消防人員之特殊防護設備	氧氣筒及防護衣。 Oxygen cylinder and protective clothing.

六、Accidental release measures 洩漏處理方法

Personal precautions 個人應注意事項	避免吸入銲錫煙氣或粉塵。 Avoid sucking the solder gas or powder.
Environmental precautions 環境注意事項	勿使洩露區域擴大。 Don't let the area of leakage be expanded.
Methods for cleaning up 清理方法	冷卻後可進行回收。 Recoverable after cooling.

七、Safe handling and storage measures 安全處置與儲存方法

Handling 處置	依廢棄物處理法規處理。 According to the refuse disposal ordinance disposal.
Storage:儲存	1. 儲存於適當的容器內並做標識。 Store in the appropriate container and do identification. 2. 置於陰涼、乾燥及通風良好區，避免高溫。 Put on the shade, drying and ventilate the good place, and avoid the high temperature. 3. 遠離氧化劑如氯氣、酸與過氧化氫等。 Far away the oxidant (ex: chlorine, acid and hydrogen peroxide…). 4. 貯藏溫度：<30℃ Custody Temperature : <30℃

八、Exposure controls measures 暴露預防措施

Engineering control:工程控制				
Control parameters 控制參數				
Element of The hazardous ingredients 元素中英文名稱	8 hours time weighted average exposure limits 八小時日時量 平均容許濃度 TWA	Short-term exposure limits 超時間時量 平均容許濃度 STEL	maximum exposure limits 最高容許濃度 CEILING	biological standards 生物指標 BEIs
錫/Tin	2 mg/m^3	4 mg/m^3	-------	-------
銀/Silver	0.01 mg/m^3	0.03 mg/m^3	-------	-------
銅/Copper	0.2 mg/m^3	-------	-------	-------

Personal protective equipment 個人防護設備	
respiratory protection 呼吸防護	➢ 一般使用：配戴口罩。 General: Wear the gauze mask. ➢ 緊急狀況：粉塵或煙霧超過容許濃度時，應配戴防粉塵及煙霧的防毒面具。 Emergency: Dust or smog exceeds permitting the concentration, need wear avoid dust and smog gas mask.
hand protection 手部防護	橡膠或塑膠的防護手套。 Rubber or plastic protective gloves.
eye protection 眼睛防護	配戴安全眼鏡及/或面罩(當有粉塵飄散或熱金屬噴濺時)。 Put on the safe glasses and/or mask (If there is dust fly about or hot metal splashing).
skin and body protection 皮膚及身體防護	應穿戴工作衣及防護手套以避免灼燙傷。 Need wear the smock and protective gloves avoid badly burned.
Hygiene measures 衛生措施	工作後，吃東西、喝飲料或抽煙前應洗手。 wash hands before eating, drinking the beverage or smoking.

九、Physical and chemical properties 物理及化學性質

Appearance (physical state, color, etc.) 外觀（物質狀態、顏色等）	物質狀態：固態 Physical state: solid 形　　狀：球狀 Form: sphere 顏　　色：銀灰色 Color: silver	
Odor 氣味	無氣味 No smell	
Odor threshold 嗅覺閾值	-----	
Melting point 熔點	218±1℃	
PH value PH 值	-----	
Boiling point/boiling range 沸點/沸點範圍	-----	
Flammability (solid, gas) 易燃性（固體、氣體）	不易燃 No Flammability.	
Flash point 閃火點	----- ^{o}F	----- ^{o}C
Test method 測試方法	☐ Open cup 開杯	☐ Close cup 閉杯
Decomposition temperature 分解溫度	-----	
Auto ignition temperature 自燃溫度	-----	
Explosion limits 爆炸界限	-----	
Vapor pressure 蒸氣壓	-----	
Vapor density 蒸氣密度	-----	
Density 密度	7.4±0.2g/cm^3	
Solubility 溶解度	-----	
Partition coefficient(n-octanol/water, 辛醇／水分配係數（log Kow）	-----	
Evaporation rate 揮發速率	-----	

十、Stability and reactivity 安定性及反應性

Stability 安定性:	
Possible hazardous reactions occurring under specific conditions 特殊狀況下可能之危害反應	金屬錫與松節油接觸會產生火災和爆炸。 This metal tin and turpentine contact will result fire and explode.
Conditions to avoid 應避免之狀況	1.　500℃以上高溫作業，會散出具有毒性的錫氧化物。 Above 500℃ high-temperature work, will produce the contain toxic tin oxides. 2.　粉末狀態於空氣中會氧化。 Powder state will be oxidized in the air.

Materials to avoid 應避免之物質	對於氧化劑、酸、濕氣有輕微的反應 With oxide, acid and humidity there is slight response.
Hazardous decomposition products 危害分解物	-----

十一、Toxicological information 毒性資料

Routes of exposure 暴露途徑	-----
Symptoms 症狀	-----
Acute toxicity 急毒性	可能造成眼睛、鼻子、喉、皮膚的刺激。 Possible induce eye, nose, throat and skin provoke.
Chronic toxicity or long term toxicity 慢毒性或長期毒性	與皮膚接觸可能使某些人產生皮膚炎或過敏。 Contacts with the skin some people will produce atopic dermatitis.

十二、Ecological information 生態資料

Ecotoxicity 生態毒性	-----
Persistence and degradability 持久性及降解性	-----
Bioaccumulative potential 生物蓄積性	-----
Mobility in soil 土壤中之流動性	-----
Other adverse effects 其他不良效應	-----

十三、Waste disposal measures:廢棄處置方法

Methods of waste disposal 廢棄處置方法	可回收再利用或依廢棄物處理法處理。 Utilizing recoverably or according to the refuse disposal ordinance disposal.

十四、Transport information 運送資料

United Nations number(UN No) 聯合國編號	-----
UN Proper shipping name 聯合國運輸名稱	-----
Transport hazard class(es) 運輸危害分類	KEEP TIGHTLY CLOSED IATA: NOT RESTRICTED
Packing group 包裝類別	-----
Marine pollutant(Yes/No) 海洋污染物（是／否）	□ Yes 是 ■ No 否
Specific transport measures and precautionary conditions 特殊運送方法及注意事項	-----

十五、Regulatory information 法規資料

Applicable regulations 適用法規	1. 職業安全衛生法 Occupational Safety and Health Act 2. 職業安全衛生設施規則 Labor safety and Health Act 3. 危害性化學品標示及通識規則 Regulations for the Labeling and Hazard Communication of Hazardous Chemicals

	4. 勞工作業場所容許暴露標準 Standards of Permissible Exposure Limits of Airborne Hazardous Substances in Workplace 5. 道路交通安全規則 Road traffic safety code. 6. 事業廢棄物貯存清除處理方法及設施標準 Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste

十六、Other information 其他資料

References 參考文獻	1. 行政院環保署，中文毒理資料庫 Environmental Protection Administration, Chinese Toxic Chemicals database. 2. 勞動部職業安全衛生署，GHS 危害物質資訊查詢系統 Occupational Safety and Health Administration, GHS harm material information inquiry system. 3. 聯合國化學品分類及標示全球調和制度（紫皮書） Globally Harmonized System of Classification and Labeling of Chemicals(GHS) 4. 關於危險貨物運輸的建議書（橘皮書） UN Recommendations on the Transport of Dangerous Goods	
Data Prepared By 製表	Company 公司	恆碩科技股份有限公司 ACCURUS SCIENTIFIC CO., LTD.
	Address 地址	中華民國台灣 717 台南市仁德區文賢路一段 508~51 號 No.508-51, Section 1, Wen-Sien Road, Rende District, Tainan City 717, Taiwan (R.O.C.)
	Telephone 電話	06-3661288 +886-6-3661288
	Prepared by 製表人	吳俊宜 Mario Wu
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