

## 安全資料表

### SAFETY DATA SHEET

#### 一、物品與廠商資料

##### Section 1 - Chemical Product and Company Identification

物品名稱：陶瓷晶片電阻 Product Name : Chip-Resistor
其他名稱：----- Other name : -----
建議用途及限制使用：電器產品之內部組件 Recommended use and restrictions on use : Electronic and electric products.
製造商或供應商名稱：華新科技股份有限公司 Manufacture or vender name : Walsin Technology Corporation
製造商或供應商地址：台灣桃園市楊梅區高獅路 566-1 號 Manufacture or vender address : 566-1, Kao-Shi Road, Yang, Tao Yuan, Taiwan
聯絡電話/傳真電話：+886-3-475-8711/+886-3-478-0913 Tel/Fax : +886-3-475-8711/+886-3-478-0913

#### 二、危害辨識資料

##### Section 2 - Hazards Identification

物品危害分類：不適用 Product hazard class : Not Available.
標示內容：無 Label content: Not Available.
其他危害：無 Other hazards : Not Available.

#### 三、成分辨識資料

##### Section 3 - Composition/information on ingredients Pure material/Mixtures

WR02xxxxxxL		重量 Weight(mg)	0.16	
物質 Substance	化學文摘社號碼 CAS No.	化學式 Formula	主要用途 Main purpose	典型% Typical %
三氧化二鋁 Aluminum oxide	1344-28-1	Al <sub>2</sub> O <sub>3</sub>	Substrate	80.0488
二氧化矽 Silicon dioxide	14808-60-7	SiO <sub>2</sub>	Substrate	1.5384
過氧化鈣 Calcium Peroxide	1305-79-9	CaO	Substrate	0.1892
氧化鎂 Magnesium oxide	1309-48-4	MgO	Substrate	0.4936
銀 Silver	7440-22-4	Ag	Backside layer	1.3140
鎳 Nickel	7440-02-0	Ni	Backside layer	0.1080
無鉛玻璃膏 Lead Free Glass	65997-18-4	Lead Free Glass Frit	Backside layer	0.1980
樹脂 Resin	9004-57-3	[C <sub>6</sub> H <sub>7</sub> O <sub>2</sub> (OH) <sub>3</sub> -n(OC <sub>2</sub> H <sub>5</sub> ) <sub>n</sub> ] <sub>x</sub>	Backside layer	0.1800
銀 Silver	7440-22-4	Ag	Topside layer	1.2495
鈀 Palladium	7440-05-3	Pd	Topside layer	0.0107
氧化鋇 Barium Oxide	1304-28-5	BaO	Topside layer	0.0962
氧化銅 Copper oxide	1317-38-0	CuO	Topside layer	0.0236
銀 Silver	7440-22-4	Ag	Topside layer 2	1.0091
鎳 Nickel	7440-02-0	Ni	Topside layer 2	0.1009
鎳 Nickel	7440-02-0	Ni	Side termination	0.0160
鉻 Chromium	7440-47-3	Cr	Side termination	0.0040
銀 Silver	7440-22-4	Ag	Resistive layer	0.1034
鈀 Palladium	7440-05-3	Pd	Resistive layer	0.0775

氧化銀 Silver oxide	20667-12-3	Ag <sub>2</sub> O	Resistive layer	0.0051
氧化鈦 Ruthenium oxide	12036-10-1	RuO <sub>2</sub>	Resistive layer	0.0259
矽酸鋯 Zirconium silicate	10101-52-7	ZrSiO <sub>4</sub>	Resistive layer	0.0259
氧化鈮 Tantalum oxide	1314-61-0	Ta <sub>2</sub> O <sub>5</sub>	Resistive layer	0.0172
氧化鈦 Titanium oxide	13463-67-7	TiO <sub>2</sub>	Resistive layer	0.0009
玻璃料 Glass frits	65997-18-4	Lead Free Glass Frit	Resistive layer	0.6040
氧化鋇 Barium Oxide	1304-28-5	BaO	Resistive layer	0.0087
氧化鋅 Zinc Oxide	1314-13-2	ZnO	Resistive layer	0.0259
三氧化二鋁 Aluminum oxide	1344-28-1	Al <sub>2</sub> O <sub>3</sub>	Resistive layer	0.0293
氧化鉛 Lead oxide	1317-36-8	PbO	Resistive layer	0.2077
氧化錳 Manganese oxide	1317-35-7	MnO <sub>2</sub>	Resistive layer	0.0034
氧化銅 Copper oxide	1317-38-0	CuO	Resistive layer	0.0051
氧化鉍 Bismuth oxide	1304-76-3	Bi <sub>2</sub> O <sub>3</sub>	Primary coating	0.6025
二氧化矽 Silicon dioxide	7631-86-9	SiO <sub>2</sub>	Primary coating	0.1288
三氧化二鋁 Aluminum oxide	1344-28-1	Al <sub>2</sub> O <sub>3</sub>	Primary coating	0.1154
二氧化鋯 Zirconium dioxide	1314-23-4	ZrO <sub>2</sub>	Primary coating	0.0571
氧化鋇 Barium Oxide	1304-28-5	BaO	Primary coating	0.0437
酞菁銅 Copper phthlocyanine	147-14-8	C <sub>32</sub> H <sub>16</sub> CuN <sub>8</sub>	Primary coating	0.0146
無鉛玻璃膏 Lead Free Glass	65997-18-4	Lead Free Glass Frit	Primary coating	0.1579
氧化矽 Silicon dioxide	14808-60-7	SiO <sub>2</sub>	Protective coating	1.9728
環氧樹脂 Epoxy Resin	25068-38-6	Epoxy Resin	Protective coating	0.5636
碳黑 Carbon Black	1333-86-4	C	Protective coating	0.5636
鎳 Nickel	7440-02-0	Ni	Plating Ni	4.7600
錫 Tin	7440-31-5	Sn	Plating Sn	3.3000

#### 四、急救措施

#### Section 4 - First Aid Measures

不同暴露途徑之急救方法： The first aid measures for different exposure routes:
<ul style="list-style-type: none"> <li>· 吸入：非蒸發性物質</li> <li>· Inhalation : Not Available.</li> </ul>
<ul style="list-style-type: none"> <li>· 皮膚接觸：無過敏反應</li> <li>· Skin contact : Not Available.</li> </ul>
<ul style="list-style-type: none"> <li>· 眼睛接觸：不會接觸眼睛</li> <li>· Eye contact : Not Available.</li> </ul>
<ul style="list-style-type: none"> <li>· 食入：不會食入</li> <li>· Ingestion : Not Available.</li> </ul>
最重要症狀及危害效應：無 The most important symptoms and hazardous effects : None.
對急救人員之防護：無 The protection of first-aiders : None.
對醫師之提示：不適用 Notes to Physician : None.

#### 五、滅火措施

## Section 5 - Fire-fighting measures

適用滅火劑：不燃物質 Suitable fire extinguishing media : This product is incombustible.
滅火時可能遭遇之特殊危害：無 Specific hazards may be encountered during fire-fighting : None.
特殊滅火程序：無 Specific fire-fighting methods : No.
消防人員之特殊防護設備：無 Special equipment for the protection of firefighters : No.

## 六、洩漏處理方法

## Section 6 - Accidental release measures

個人應注意事項：無 Personal precautions : No.
環境注意事項：無 Environmental precautions : No.
清理方法：無 Methods for cleaning up : No.

## 七、安全處置與儲存方法

## Section 7 - Handling and storage

處置：一般處置 Handling : No special advice.
儲存：依濕敏感係數等級一之方法貯存。 Storage : Following the method defined in MSL level 1.

## 八、暴露預防措施

## Section 8 - Exposure controls/personal protection

工程控制：無 Engineering control: No
控制參數： Control parameters :
<ul style="list-style-type: none"> <li>· 八小時日時量平均容許濃度/短時間時量平均容許濃度/最高容許濃度：無</li> <li>· 8 hours time weighted average exposure limits/Short-term exposure limits/maximum exposure limits : No.</li> <li>· 生物指標：無</li> <li>· Biological standards : No.</li> </ul>
個人防護設備： Personal protective equipment :
<ul style="list-style-type: none"> <li>· 呼吸防護：無</li> <li>· Respiratory protection : No.</li> <li>· 手部防護：無</li> <li>· Hand protection : No.</li> <li>· 眼睛防護：無</li> <li>· Eye protection : No.</li> <li>· 皮膚及身體防護：無</li> <li>· Skin and body protection : No.</li> </ul>
衛生措施：無特殊要求 Hygiene measures: No special requirement.

## 九、物理及化學性質

## Section 9 - Physical and chemical properties:

外觀（物質狀態、顏色等）：四方陶瓷體 Appearance ( physical state, color, etc. ) : Cuboid ceramic.	氣味：無 Odor : No.
嗅覺閾值：無 Odor threshold : No defined.	熔點：1500 °C Melting point: 1500 °C
pH值：不適用 pH value : Not available.	沸點/沸點範圍：未測試 Boiling point/boiling point range: Not be tested.
易燃性（固體、氣體）：不燃 Flammability ( solid, gas ) : incombustible.	閃火點：°F °C : 未測試 Flash point: °F °C : Not be tested.
分解溫度：未測試 Decomposition temperature : Not be tested.	測試方法：開杯閉杯 Test method : Open cup Closed cup.
自燃溫度：不燃 Auto-ignition temperature: incombustible.	爆炸界限：不會爆炸 Explosion limits : Not Available.
蒸氣壓：--- Vapor pressure: Not Available.	蒸氣密度：不適用 Vapor density : Not Available.
密度：≈ 4 Density: ≈ 4	溶解度：不適用 Solubility : Not Available.
辛醇／水分配係數（log Kow）--- Partition coefficient ( n-octanol/water,log Kow ) : ---	揮發速率：不適用 Evaporation rate : Not Available.

## 十、安定性及反應性

## Section 10 - Stability and reactivity

安定性：安定
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Stability : Stable.
特殊狀況下可能之危害反應：無 Possible hazardous reactions under specific conditions : No.
應避免之狀況：無 Conditions to avoid : No.
應避免之物質：無 Materials to avoid : No.
危害分解物：無 Hazardous decomposition products : No.

### 十一、毒性資料

#### Section 11 - Toxicological information

暴露途徑：不適用 Routes of exposure: Not available.
症狀：無 Symptoms: No.
急毒性：無 Acute toxicity: No.
慢毒性或長期毒性：無 Chronic toxicity or long term toxicity: No.

### 十二、生態資料

#### Section 12 - Ecological information:

生態毒性：無 Ecotoxicity : No.
持久性及降解性：--- Persistence and degradability : ---
生物蓄積性：--- Bioaccumulative potential : ---
土壤中之流動性：--- Mobility in soil : ---
其他不良效應：無 Other adverse effects : No.

### 十三、廢棄處置方法

#### Section 13 - Disposal considerations

廢棄處置方法：依當地環保法規之規定處理 Methods of waste disposal : Follow the local regulation.
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### 十四、運送資料

#### Section 14 - Transport information

聯合國編號：不適用 United Nations number ( UN No ) : Not available.
聯合國運輸名稱：不適用 UN Proper shipping name : Not available.
運輸危害分類：不適用 Transport hazard class ( es ) : Not available.
包裝類別：不適用 Packing group: Not available.
海洋污染物 (是/否)：否 Marine pollutant ( Yes/No ) : No.
特殊運送方法及注意事項：無 Specific transport measures and precautionary conditions : No.

### 十五、法規資料

#### Section 15 - Regulatory information

適用法規：2011/65/EU, EC-1907-2006 Applicable regulations: 2011/65/EU, EC-1907-2006
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### 十六、其他資料

#### Section 16 - Other information

參考文獻 Literature references		
製表單位 Organization that prepared the MSDS	名稱：華新科技股份有限公司 Name: Walsin Technology Corporation 地址/電話：台灣桃園市楊梅區高獅路 566-1 號 Address/telephone number: 566-1, Kao-Shi Road, Yang Mei, Tao Yuan, Taiwan	
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製表日期 Date that the MSDS was prepared:	2017/3/31	