物質安全資料表
MATERIAL SAFETY DATA SHEET

PK-ZERO

1. 物品與廠商資料表 PRODUCT & COMPANY IDENTIFICATION

物品名稱 Product Name：PK-ZERO
其他名稱 Chemical Name：-
建議用途及限制使用 Recommended Product Usage：電力/微電力應用 Electronics/Microelectronics application.

2. 危害辨識資料 HAZARDS IDENTIFICATION

物品危害分類 Hazard Classification：

1. 腐蝕/刺激皮膚物質第 3 級 Skin corrosion/irritation Category 3
2. 嚴重損傷/刺激眼物質第 2 級 Serious eye damage/eye irritation Category 2
3. 水環境之危害物質(慢毒性)第 1 級 Chronic hazards to the aquatic environment Category 1
4. 特定標的器官系統毒性物-單一暴露第 3 級 Specific target organ toxicity of material-single expose Category 3

標示內容 Label Elements Including Precautionary Statements：

象徵符號 Symbol：

警示語 Signal Word：警告 Warning

• 危害警告訊息 Hazard Risk Statement：

1. 吞食有害。Swallow harmfully.
2. 長期接觸造成皮膚刺激。Long-term exposure causes skin irritation.
3. 直接接觸造成眼睛刺激。Direct contact causes eyes irritation.
4. 對水生生物毒性大並具有長期持續的影響。Very toxic to aquatic life with long lasting effects.
5. 可能造成呼吸道刺激。May cause respiratory tract irritation.

• 危害防範措施 Precautionary Statement：

1. 若與眼睛接觸，立刻以大量的水洗滌後洽詢醫療。
   If contact with eyes, wash immediately with plenty of water after contact medical.
2. 如遇意外或覺得不適，立即洽詢醫療。In case of accident or feel uncomfortable immediately contact your health care.
3. 避免釋放至環境中。It's avoided releasing to the environment.
4. 穿戴適當的防護衣物、手套、戴眼罩/護面罩。Wear suitable protective clothing, gloves, wear goggles / face shield.
5. 物質及容器廢棄時需視為危害物處置。Material and its container as hazardous waste material disposal is required.

其他危害 Other Hazard：-

3. 成分辨識資料 COMPOSITION/INFORMATION ON INGREDIENTS

化學性質 Chemical Characterization：混合物 Mixture

危害物質成分之中英文名稱 Chemical Name	化學文摘社登記號碼 CAS NO.	濃度或濃度範圍(成分百分比) Content (%)
氧化鋅 Zinc oxide	1314-13-2	＞50 %
鋁 Aluminum	7429-90-5	＞10 %

4. 急救措施 FIRST AID MEASURES

不同暴露途徑之急救方法 First aid measure：

- **吸入 Inhalation：**

1. 若發生緊急效應時，應將患者移至空氣新鮮處。
   If the effects of an emergency, the patient should be moved to fresh air.
2. 若無呼吸，立即進行人工呼吸。If not breathing, give CRP immediately.
3. 若呼吸困難，由受過訓練且合格的人供給氧氣。
   If breathing is difficult, by trained and qualified people who supply oxygen.
4. 立即送醫。Take to hospital immediately.

- **皮膚接觸 Skin：**以肥皂及水清洗。Wash with soap and water.
- **眼睛接觸 Eyes：**以大量清水沖洗，送醫診療。Wash with plenty of water and take to the hospital.
- **食入 Oral：**無有效方式，送醫診療。Get medical attention.

最重要症狀及危害效應 Important Symptoms and Hazard Effects：

發燒、嘔吐、吸入有害、呼吸道刺激。Fever, vomiting, inhalation of harmful, respiratory tract irritation.

對急救人員之防護 Protection for first aid or rescue personnel：

1. 急救人員需了解所涉及的物質，以保護自己和採取防範措施。
   Emergency personnel need to understand the material covered to protect them and take preventive measures.
2. 配戴安全眼鏡及穿著 C 級化學防護衣。Wear safety glasses and wear Level C chemical protective clothing.
3. 不可用口對口人工呼吸法，建議施與人工呼吸時使用具有單向閥的口袋面罩或其它適當的輔助呼吸醫療器材。
   Do not use mouth to mouth artificial breathing; giving CPR suggested the use of pocket masks with one-way valve or other proper respiratory medical equipment assistance.

對醫師之提示 Note to physicians：–

5. 滅火措施 FIRE-FIGHTING MEASURES

適用滅火劑 Suitable Extinguishing Media：

1. 不可用水直接噴灑，可使用酒精泡沫、化學乾粉、二氧化碳及海龍滅火劑控制火勢。
   Not directly sprayed with water, use alcohol foam, dry chemical, carbon dioxide and Halon fire extinguishing agent to control the fire.
2. 以水霧或灑水冷卻暴露於火場中的儲槽或容器外側。
   Water mist or water spray to cool fire exposed tanks or containers in the outside.

特殊滅火程序 Special Fire Fighting Procedures：

1. 安全狀況下將容器搬離火場。Removed the containers from the fire in the security situation.
2. 勿用高壓蒸氣驅散外洩物質。Do not use high pressure steam to disperse the leaking substance.
3. 築堤圍堵外洩物後廢棄處置。After the embankment material waste disposal containment leakage.
4. 針對週遭的火災使用適用的滅火劑。Applicable for use around the fire extinguishing agent.
5. 避免吸入化學物質或燃燒副產品。Avoid inhalation of chemicals or combustion by-products
6. 人員需待在上風處並遠離低窪地區。People need to stay upwind and away from low-lying areas.
7. 水或泡沫可能造成浮沫。Water or foam may cause floating foam.

消防人員之特殊防護設備 Special protective equipment for the Fire Fighters：

建議消防人員配戴 B 級化學防護衣、空氣呼吸器（必要時外加抗閃火鋁質披覆外套）。

Recommendations firefighters wear Level C chemical protective clothing and air respirators.

(If necessary, flash fire resistant aluminum coating applied coat.)

6. 洩漏處理方法 ACCIDENTAL RELEASE MEASURE

個人應注意事項 Personal Precaution：

1. 避免直接接觸眼睛。Avoid eyes contact.
2. 確認清理工作是由受過訓練的人員負責。Clean-up work was recognized by trained staff.
3. 穿戴適當的個人防護裝備。Wear proper personal protective equipment.

環境注意事項 Environmental Precautions：

1. 污染區未完全清理前，限制人員接近，直至完全清乾淨為止。
   Not completely clean up the contaminated area before officers close to the limit, until fully repaid cleaning up.
2. 確認清理工作是由受過訓練的人員負責。Clean-up work was recognized by trained staff.
3. 穿戴適當的個人防護裝備。Wear proper personal protective equipment.
4. 使用沙土或其他適合的障避物來防止擴散或進入下水道、排水溝或河川。
   Use sand or other suitable material to avoid obstacles to prevent the spread or entry into sewers, drains or rivers.

清理方法 Method for Cleaning up：

1. 勿碰觸洩漏物。Do not touch the spill.
2. 避免外洩物流入下水道、水溝或其它侷限空間內。
   Prevent leakage flow into the sewer, ditch or other confined space.
3. 使用溶劑、蒸汽或清潔劑作最後的清理。使用後已飽和浸透的吸收劑，可能發生自熱現象，應妥善處理。
   The use of solvents, steam or detergent to make a final cleanup. Saturated absorbent occur self-heating phenomenon. It should be properly treated.
4. 灑水或以水霧減少蒸氣，避免廢水接觸洩漏物質。
   Sprinkler or water spray to reduce vapors; avoid contact with water leaking substances.

7. 安全處置與儲存方法 HANDLING & STORAGE

處置 Handling Precautions：

1. 工作地區維持良好的衛生習慣。Working areas to maintain good health habits.
2. 避免吸入，並避免與皮膚以及眼睛接觸。Avoid inhalation, and to avoid skin and eye contact.
3. 有暴露危害時應穿戴呼吸防護具。Hazards of exposure should wear breathing apparatus.
4. 作業中禁止飲食、吸煙。Against eating and smoking in operations.
5. 避免接觸不相容物質。Avoid contact with incompatible substances.
6. 避免熱源。Avoid heat.
7. 避免容器物理性損害。Avoid physical damage to containers.
8. 在通風良好處處置。Disposal in a well ventilated area.
9. 可局部排氣通風系統以確保作業環境安全，如維持暴露量低於可暴露標準濃度，否則就必須穿戴個人防護裝備。
   Local exhaust ventilation may be to ensure the safety of operating environment, such as maintaining exposure levels below the exposure standard, or must wear personal protective equipment.
10. 容器不用時需緊閉。Containers closed when not needed.
11. 使用後務必用肥皂及水洗手。Be sure to use after washing hands with soap and water.
12. 工作服分開清洗。Wash clothes separately.

儲存 Storage Conditions：

1. 依廠商建議包裝。According to the manufacturer's suggested packing.
2. 檢查容器是否有清楚標示。Check containers are clearly labeled.
3. 使用鋼製、金屬或塑膠容器儲存。Use of steel, metal or plastic container storage.
4. 避免與氧化劑反應。Avoid reaction with oxidants.
5. 遵守廠商提供的操作與儲存建議。Compliance with the operating and storage manufacturers to provide proposed.
6. 儲存於原容器中。Stored in the original container.
7. 儲存在陰涼、乾燥及通風良好的區域。Store in a cool, dry and ventilated area.
8. 遠離氧化性物質。Away from oxidizing substances.
9. 避免容器物理性破壞。Avoid physical damage to containers.
10. 遠離熱源或引光源/裸光。Keep away from heat or cited sources / naked light.
11. 保持容器緊閉。Keep container tightly closed.
12. 定期檢測洩漏及外溢。Detect regularly leaks and spills.

8. 暴露預防措施 EXPOSURE CONTROL/PERSONAL PROTECTION

工程控制 Engineering Controls：

1. 作業環境應有局部排氣及換氣裝置。
   Work environment and should have local exhaust ventilation devices.
2. 若作業環境中出現煙霧，須使用呼吸防護設備。
   To use respiratory protective equipment if smoke appears in the working environment.
3. 倉庫或密閉空間需提供足夠之通風。Storage or confined space need to provide sufficient ventilation.

控制參數 Control Parameters：

八小時日時量 平均容許濃度 Time-Weighted Average	短時間時量 平均容許濃度 Short Term Exposure Limit	最高容許濃度 Ceiling concentration	生物指標 BEIs
5 mg/m^3	10 mg/m^3	-	-

個人防護設備 Personal Protective Equipment：

呼吸防護 Respiratory protection：

供氣式呼吸防護具或空氣呼吸器(自攜式呼吸防護具)

Air-supplying respirator or breathing apparatus (self-contained breathing apparatus)

手部防護 Hand protection：配戴氯丁烯橡膠、硝酸鹽等材質的防滲手套。Wear gloves.

眼睛防護 Eye protection：化學護目鏡。Safety glasses .

皮膚及身體防護 Skin protection：橡膠材質連身式防護衣，安全鞋及緊急沖洗器。

Protective clothing style rubber coveralls, safety shoes and emergency washing.

衛生措施 Hygiene Measures：

1. 工作後儘速脫掉污染之衣物，洗淨後才可再穿戴或丟棄，且須告知洗衣人員污染物之危害性。
   Work as quickly as possible off contaminated clothing and wash before reuse or disposal, and laundry workers to be informed of the hazardous pollutants.
2. 工作場所嚴禁抽煙或飲食。Smoking and eating are Forbidden.
3. 處理此物後，須徹底洗手。Wash your hands after dealing with this matter.
4. 維持作業場所清潔。Maintain clean work area.

9. 物理及化學性質 PHYSICAL & CHEMICAL PROPERTIES

外觀 Appearance：灰色脂膏狀 Grey Grease	**氣味 Odor：**無 Odorless
嗅覺閥值 Odor Threshold：–	**熔點 Melting point：**-
PH 值 PH：–	**沸點/沸點範圍 Boiling point：**350℃(1005hPa)
易燃性(固體、氣體) Flammability (Solid, Gas)：–	**閃火點 Flash point：**165 ℃
分解溫度 Decomposition Temperature：–	**測試方法 Test method：**開杯 (Open Cup)
自燃溫度 Auto ignition Temperature：＜450 ℃	**爆炸界限 Explosive Limit：**–
蒸氣壓 Vapor pressure@25℃：＜1mmHg	**蒸氣密度 Vapor density：** 水中溶解度為 1.6ppm@29℃ Solubility in water is 1.6ppm1.6ppm@29℃
密度 Density：2.6±0.2g/cm^3	**溶解度 Water solubility：**–
辛醇/水分配係數 (log Kow) **Partition Coefficient (n-Octanol/Water)：**–	**揮發速率** Evaporation Rate：–

10. 安定性及反應性 STABILITY & REACTIVITY

安定性 Stability：正常狀態下安定。Stable in normal use.

特殊狀況下可能之危害反應 Possibility of Hazardous Reactions：

1. 酸(強)：不相容。激烈反應。 Acid (strong): Incompatible. Intense reaction.
2. 鎂：受熱會產生爆炸性反應。 Magnesium: heat will produce an explosive reaction.

應避免之狀況 Conditions to Avoid：避免產生粉塵。To avoid dust.

應避免之物質 Materials to Avoid：

碳鹵化物、可燃物、金屬、酸、氧化性物質 Carbon halides, fuel, metals, acids, oxidizing substances.

危害分解物 Hazardous Decomposition：

金屬氧化物、二氧化碳及碳氧化物、二氧化矽、甲醛。

Metal oxides, carbon dioxide and carbon oxides, silicon dioxide, formaldehyde.

11. 毒性資料 TOXICOLOGICAL INFORMATION

暴露途徑 Route of Exposure：吸入、眼睛、皮膚、食入 Inhale、Eyes、Skin、Ingestion

症狀 Signs and Symptoms of Overexposure：

正常使用下，無明顯不良影響。No significant adverse effects under normal use.

急毒性 Acute Toxicity：

吸入 Inhalation：

1. 造成上呼吸道輕微不適感。Causing slight discomfort of upper respiratory tract.
2. 若經由肺部吸收，將侵襲心血管及神經系統。
   If absorbed through the lungs, the cardiovascular and nervous system invasion.

眼睛 Eyes：

1. 直接接觸可能會引起短暫的充血發紅與不適感。
   Direct contact may cause temporary redness and discomfort of congestive.
2. 可能導致眼睛整體或部分永久性損害。Whole or in part may result in permanent damage to eyes.
3. 對眼睛造成嚴重刺激導致發炎，重覆或長時間暴露刺激下，將導致結膜炎。
   Cause severe irritation to the eyes causing inflammation, repeated or prolonged exposure to stimulation will lead to conjunctivitis.

皮膚 Skin:對皮膚造成不適感。Cause the skin discomfort.

食入 Ingestion：正常使用下攝入危害性低。In normal use, Ingestion is low harmful.

慢毒性或長期毒性 Chronic Toxicity：

大量攝入可能會傷害身體內部系統或器官。吸入煙霧可能導致金屬味覺、發熱、懼寒、疼痛及胸腔發悶等症狀。

High intake may damage the body's internal systems or organs. Inhalation of fumes may cause metal taste, fever, fear of cold, chest pain and nausea and other symptoms.

LD50：240 mg/kg (大鼠、腹腔注射 rats injection)

LC50：＞200 mg/L (大鼠、吸入 rats, inhalation)

12. 生態資料 ECOLOGICAL INFORMATION

生態毒性 Aquatic and Terrestrial Ecotoxicity：LC50(魚類 Fish)：224600μg/L/96H (鱂 Pimephales promelas)
持久性及降解性 Persistence and Degradability：固體物質，不溶於水。Solid material, insoluble in water.
生物蓄積性 Bioaccumulative：無。None.
土壤中之流動性 Mobility in Soil：預期在土壤中不具移動性。Expected in the soil does not have mobility.
其他不良效應 Other Adverse Effects：-

13. 廢棄處置方法 DISPOSAL CONSIFERATIONS

廢棄處置方法 Disposal method：

依廢棄物清理法相關法規辦理。This material must be disposed of as hazardous waste.

14. 運送資料 TRANSPORT INFORMATION

聯合國編號 UN No.：3082
聯合國運輸名稱 Proper Shipping Name： 對環境有害的液態物質，未另作規定的。ENVIRONMENTALLY HAZARDOUS SUBSTANCE,LIQUID, N.O.S.
運輸危害分類 Hazard Label(s)： 1. UNDG 分級:無規定 NOT REGULATED (美國交通部) 2. ICAO/IATA 分級:無規定 NOT REGULATED (國際航運組織) 3. IMDG 分級:無規定 NOT REGULATED (國際海運組織)
包裝類別 Packing Group：III
海洋污染物（是／否） Marine Pollutant (Yes/No)：否 No
特殊運送方法及注意事項 Special Requirements and Additional Information：-

15. 法規資料 REGULATORY INFORMATION

適用法規 Applicable Laws：危險物及有害物通識規則。Dangerous and harmful materials of general rules.

16. 其他資料 OTHER INFORMATION

參考文獻 Literature References：

1. 工業技術研究院工業安全衛生技術發展中心，物質安全資料表光碟資料
   Industrial Technology Research Institute of Industrial Safety and Health Technology Development Center, Material Safety Data Sheet CD-ROM data.
2. 中國國家標準 CNS15030「化學品分類及標示」
   Chinese National Standard CNS15030 "Classification and labeling of chemicals"
3. 中國國家標準 CNS6864「危險物運輸標示」
   Chinese National Standard CNS6864 "hazardous materials transport labeled "
4. 聯合國關於危險貨物運輸建議書 (2005 年第十四修定版)
   United Nations Recommendations on the Transport of Dangerous Goods. (fourteenth revised edition 2005)

5. 化學品全球分類及標示調和制度(全球調和制度)(2005 年第十四修定版)
Classification and labeling of chemicals to reconcile the global system.
(the global harmonization system) (fourteenth revised edition 2005)
6. 緊急應變指南 2004 年版 Emergency Response Guide 2004 Edition.

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備註 Note：上述資料中符號”－”代表目前查無相關資料。
The above data symbol "-"means doesn’t find the related information.

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The data produced by the company, all data and information for reference only. Please follow the application needs the user to determine their availability, in particular, should pay attention to the possible mixing of different hazards, and hazardous materials and hazardous materials in accordance with labeling and General Rules of the relevant provisions of the labor necessary to provide health and safety precautions.