RISALAH DATA KESELAMATAN KIMIA
/ MATERIAL SAFETY DATA SHEET

NAMA PRODUK : ZINK OKSIDA
PRODUCT NAME : ZINC OXIDE

<table>
<thead>
<tr>
<th>REVISION NO</th>
<th>REVIEW DATE</th>
<th>REVIEWED BY</th>
<th>APPROVED BY</th>
</tr>
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<tbody>
<tr>
<td>D</td>
<td>23.05.14</td>
<td>S.PARTHASARATHEE</td>
<td>JOHN CHONG</td>
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<td>QA EXECUTIVE</td>
<td>MANAGING DIRECTOR</td>
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</tbody>
</table>

Revision: D
SECTION 1 : PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Details:-

Product Name : Zinc Oxide
Trade Name : Red Seal / White Seal / Pharma
Chemical Name : Zinc Oxide
Synonyms : Zinc White, Flowers of Zinc, Philosopher’s Wool, Chinese White.
Chemical Formula : ZnO
Molecular Weight : 81.39
CAS Number : 1314-13-2
EC Number : 215-222-5
Chemical Family : Metallic Oxide
Manufacturer’s Name : Approfit Zinc Oxide Mfg Sdn Bhd
Manufacturer’s Code : 223363 - P
Uses : Accelerator, activator, pigment and reinforcing agent in rubber; ointment; pigment and mold growth inhibitor in paints; ceramics; floor tile; glass; Zinc salts(Zinc Stearate etc) feed additive; semi-conductor in electronic devices; electronic ceramics, raw material to produce Zinc Phosphate as steel coating.

1.2 Company Identification:-

Manufacturer’s Name & Address : Approfit Zinc Oxide Mfg Sdn. Bhd.
Lot 102, Lorong Senawang 4/2,
Senawang Industrial Estate,
70450 Senawang.
Negeri Sembilan Darul Khusus.

Emergency Tel. No. : 03-80682288 / 06-6775239 (Office Hour).
: 012-2971783 (After Office Hour).
SECTION 2 : HAZARD IDENTIFICATION

Hazard pictogram

Signal word : Warning
Hazard statements : H410 – Very toxic to aquatic life with long lasting effects.
Precautionary statements
Prevention : P273- Avoid release to the environment
Response : P391- Collect spillage

Safety Phrase : S36 Wear Suitable Protective Clothing
Health Rating : 2 - Moderate
Flammability Rating : 0 - None
Reactivity Rating : 0 - None
Contact Rating : 1 - Slight
Storage colour code : Green (General storage)
Flash Point : 1436°C

SECTION 3 : COMPOSITION OF /INFORMATION ON INGREDIENTS

Product/Ingredient : Zinc Oxide
CAS No. : 1314-13-2
EINECS : 215-222-5
RTECS No. : ZH4810000
Proportion : Essentially 100%
SECTION 4: FIRST AID MEASURES

Ingestion: Provide rest, warmth and fresh air. Rinse mouth and drink plenty of water. Seek medical attention if vomiting or person is unconscious.

Eye Contact: Immediately flush eyes with plenty of running water for at least 15 minutes. Seek medical attention if irritation occurs.

Skin Contact: Wash skin with soap and water. Wash clothing before reuse. Call a physician if irritation occurs.

Inhalation: Move to fresh air and keep at rest. If breathing is difficult get immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

Fire & Explosion Hazards: Not flammable
Flash point: Not Applicable
Auto-ignition temperature: Not Applicable
Extinguishing media: Non Combustible

Fire fighting instruction: Use extinguishing media appropriate to surrounding fire conditions. Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Special hazards arising from the substance or mixture:

This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special hazards: May emit toxic fumes under fire conditions.
SECTION 6: ACCIDENTAL RELEASE MEASURE

Leak/Spill: Utilize recommended protective clothing and equipment. Clean spills in a manner that does not disperse dust into the air. Recover the product and place in appropriate containers. The containers should be labeled, clean, dry and fitted with a cover. Dispose per published norms and/or contact the manufacturer for assistance and recommendation on disposal of the product. Collect wash water for approved disposal. Observe any Federal, State or local rules relative to disposal of the material.

Environmental: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

SECTION 7: HANDLING AND STORAGE

Storage Temperature (min/max): Ambient / Ambient.

Shelf Life: 3 years, if tightly closed and properly stored, in dry cool place.

Special Sensitivity: None.

Handling: Avoid release to environment. Avoid breathing dust. Avoid getting in eyes or on skin. Wash thoroughly after handling.

Storage: Store in a dry place away from direct sunlight, heat and incompatible materials. Store away from food and beverages. Containers of this material may be hazardous when empty since they retain product residues (dust/solids); observe all warnings and precautions listed for the product.
SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limit :-
- OSHA Final PELS : 5mg/m³ TWA (fume) 15mg/m³ TWA (total dust)
  5mg/m³ TWA (respirable fraction)
- OSHA Vacanted PELS : 5mg/m³ TWA (fume) 10mg/m³ TWA (total dust);
  5mg/m³ TWA (respirable fraction)
- ACGIH : 2mg/m³ TWA (respirable fraction); 10 mg/m³ STEL (respirable fraction)
- NIOSH : 5mg/m³ TWA (dust and fume) 500mg/m³ IDLH

Eye protection : Safety glasses or chemical safety goggles are recommended.

Skin protection : Rubber gloves with impervious boots, apron or coveralls is recommended. Employees should wash their hands and face before eating, drinking or using tobacco products.

Respiratory protection : Work ambient concentrations should be monitored and if the recommended exposure limit is exceeded, a DOSH approved dust respirator must be worn.

If the concentration is over 250 mg/m³:
- Requires an air purifier respirator with full facial unit complete with high efficiency particle filter, positive pressure or standard respirator complete with full facial unit.

If the concentration is over 2500 mg/m³:
- Self-contained half mask apparatus.
  GLOVES: *protective gloves
  CLOTHES:*appropriate working clothes.
  EYE PROTECTION:*anti-splash or anti-dust safety goggles. Do not use contact lenses as safety equipment.

Ventilation requirement : Use local ventilation if dusting is a problem, to maintain air levels below the recommended exposure limit.
SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

Physical Form : Fine Powder  
Colour : White to Yellowish - White  
Odour : Odourless  
Solubility : Insoluble in water/alcohol; soluble in dilute acids.  
Solubility in water : 0.16mg/100ml (30°C)  
Boiling Point : 2360°C  
Melting Point (°C) : 1975°C  
Vapour Pressure (mm of Hg at 25°C) : Not Applicable  
Percent Volatiles : Not Applicable  
Evaporation Rate : Not Applicable  
Density : 5.606g/cm³  
Specific Gravity : 5.47

SECTION 10 : STABILITY AND REACTIVITY

Conditions to Avoid : Excessive temperatures. (Zinc oxide sublimes to produce toxic fumes)  
Stability : Stable under ordinary conditions of use and storage.  
Hazardous Polymerization : Will not occur.  
Incompatibilities : Strong Oxidizing Agents.  
Chlorinated rubber : Violent reaction or explosion with Zinc Oxide at 215°C  
Flax oil : Exothermic reaction with possibility of ignition.  
Magnesium : If heated: explosive reaction.  
Strong bases and acids : Possibility of violent reaction
SECTION 11 : TOXICOLOGICAL INFORMATION

Toxicity Data:
- ORL-HMN LDLO: 500 mg/kg YAKUD5 22,291,1980
- IPR-RAT LD50: 240 mg/kg ZDKAA8 38(9),18,1978
- ORL-MUS LD50: 7950 mg/kg GISAAA 51(4),89,1986
- IHL-MUS LC 50: 2500 mg/m³ IPSTB3 3,93,1976

Irritation Data:
- SKN-RBT 500mg / 24h MLD 28 ZPAK -,10,1972
- EYE-RBT 500mg / 24h MLD 28 ZPAK -,10,1972

Carcinogenicity:
This product is not listed by NTP, IARC or regulated as carcinogen by OSHA.

EFFECTS OF OVEREXPOSURE

Route of Entry  Effects

Inhalation: May irritate the respiratory tract. Symptoms may include coughing, shortness of breath, sore throat and runny nose. If sufficient amounts are inhaled and absorbed, symptoms may resemble those in acute ingestion.

Skin: Irritation with symptoms of redness, swelling, itching and pain.

Eye: Irritation with symptoms of redness, swelling, itching, tearing and pain.

Ingestion: May cause gastroenteritis with abdominal pain, nausea, vomiting and diarrhea. Systemic effects may follow and may include ringing of the ears, dizziness, elevated blood pressure, blurred vision and tremors.

Chronic Effects: Prolonged skin contact can produce a severe dermatitis called oxide pox. Severe overexposure may result in bronchitis or pneumonia with a bluish tint to the skin. Repetitive of prolonged exposure to zinc oxide fumes may cause conjunctivitis.

Medical Conditions Generally Aggravated by exposure:
Persons with pre-existing eye or skin conditions or impaired pulmonary function may be more susceptible to the effects of this product.
SECTION 12 : ECOLOGICAL INFORMATION

Toxicity

<table>
<thead>
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<th>Product/Ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
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<tbody>
<tr>
<td>Zinc Oxide</td>
<td>Acute EC50 0.042mg/L Fresh water</td>
<td>Algae-Pseudokirchneriella subcapitata-Exponential growth phase.</td>
<td>72 hours</td>
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<td>Acute LC50 98ug/l fresh water</td>
<td>Daphnia-Daphnia magna-Neonate</td>
<td>48 hours</td>
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<tr>
<td></td>
<td>Acute LC50 320ppm fresh water</td>
<td>Fish-lepomis macrochirus</td>
<td>96 hours</td>
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<td>Chronic NOEC 0.017mg/L Fresh water</td>
<td>Algae-Pseudokirchneriella subcapitata-Exponential growth phase.</td>
<td>72 hours</td>
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</table>

Persistence and degradability: no data available.

Bio-accumulative potential

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<tr>
<th>Product/Ingredient name</th>
<th>LogPow</th>
<th>BCF</th>
<th>Potential</th>
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<tbody>
<tr>
<td>Zinc Oxide</td>
<td>-</td>
<td>60960</td>
<td>high</td>
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</tbody>
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Mobility: no data available

Other adverse effects: no known significant effects or critical hazards

SECTION 13 : DISPOSAL INFORMATION

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.
SECTION 14 : TRANSPORT INFORMATION

US HM-18 : Nil.

DOT Classification : Hazard class: XCP; Not regulated for domestic transport.

TDG Classification : Not regulated

IMO/IMDG : Not regulated

ICAO/IATA : Not regulated

EU ADR/RID, AND/ADNR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Oxide) UN 3077, Class 9, PGIII, Classification Code M7

Above marking are applicable to EU ADR/RID and AND/ADNR only

SECTION 15 : REGULATORY INFORMATION

STATUS INFORMATION

OSHA : This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA : On TSCA Inventory.
SARA TITLE III: This product is subject to Sara section 313 reporting requirements.

RCRA: If discarded in its purchased form, this product would not be hazardous waste either by listing or characteristic. However under RCRA, it is the responsibility of the product user to determine the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24).

CALIFORNIA Proposition 65: To the best of our knowledge, this product contains no levels of listed substances, which the state of California has found to cause cancer, birth defects or other reproductive effects.

EUROPEAN: EC NO: 215-222-5
Zinc Oxide is not considered environmentally hazardous outside of EU. ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Oxide) UN 3077, Class 9, PG111.
Ingredients listed on the European inventory of existing commercial chemical substances (EINECS).................Yes, on inventory

WARNING, H410: very toxic to aquatic life with long lasting effects
P273: Avoid release to the environment
P391: Collect spillage
P501: Disposal of contents/container as hazardous or special waste in accordance with applicable law.
SECTION 16 : OTHER INFORMATION

Reason of Issue : 1) CLASS requirements
                 2) New information gathered from wikipedia and other websites.

NOTIFICATION.

No representations or warranties either expressed or implied or merchantability, fitness flora particular purpose or any other nature are made here under with respect to the information contained herein or the product to which the information refers. Buyer assumes risks of the use, storage and handling. Approfit Zinc Oxide Mfg Sdn Bhd, shall not be liable for any incidental or consequential damages arising or indirectly in connection with the purchase, use, storage or handling of this product. This information contained herein is, to be best of our knowledge, true and accurate. However, all recommendations or suggestions are made without guarantee, since the conditions of use are beyond our control. This information is not to be taken as a license to operate under, or a recommendation to infringe any patent (s). The observance of all regulations and patents is the responsibility of the user.