

ZOCHEM INC.

A SUBSIDIARY OF HORSEHEAD HOLDING CORP.

# MATERIAL SAFETY DATA SHEET

Material Name: Zinc Oxide

## Protective Clothing Pictogram



**CANUTEC 24 hour emergency tel. number:  
1-613-996-6666 (collect)  
or \*666 (cellular)**

**MATERIAL SAFETY DATA SHEET****Material Name: Zinc Oxide****SECTION 1      PRODUCT AND COMPANY IDENTIFICATION**

<b>Product Identity</b>	Zinc Oxide
<b>Synonyms</b>	Zinc White, Chinese white
<b>Molecular Formula</b>	ZnO
<b>Trade Names</b>	ZOCO
<b>CAS Registry Number</b>	1314-13-2
<b>EINECS Number</b>	215-222-5
<b>Manufacturer</b>	Zochem Inc. 1 Tilbury Court, (P.O. Box 1120) Brampton, Ontario, Canada L6V 2L8
<b>Use of substance</b>	Rubber products, chemical products, ceramics, paints & coatings, pharmaceuticals and many others
<b>Emergency Telephone</b>	1-905-453-4100 (Day) and 1-905- 453-6477 (Night)
<b>Issue Date</b>	May 4, 2011
<b>Supersedes Date</b>	December 13, 2010

**SECTION 2      HAZARDS IDENTIFICATION**

<b>Emergency Overview</b>	Zinc oxide is a fine white odorless powder that is not flammable or combustible under normal conditions of transport and storage. It is insoluble in water. Inhalation of zinc oxide dust may cause coughing, choking or irritation of the nose, throat, and upper respiratory tract. Inhalation of freshly formed zinc oxide can lead to metal fume fever. The dust may cause eye and skin irritation. Zinc oxide is not carcinogen.
<b>OSHA Regulatory Status</b>	This material is not hazardous. Please refer to Section 15, "Regulatory Information" for status with respect to various regulations.
<b>Potential Health Effects</b>	Zinc Oxide dust is primarily a nuisance dust, but exposures to high concentrations can result in respiratory system effects in humans. Volunteers inhaling 600 mg/m <sup>3</sup> zinc oxide dust for 10 minutes exhibited persistent rales, decrease vital capacity, coughing, upper respiratory tract irritation and substernal pain. Studies have reported that exposures to concentrations up to 430 mg/m <sup>3</sup> zinc oxide resulted in chest pain. Inhalation of zinc oxide fume can result in metal fume fever with symptoms of chills, mild fever and aching muscles and joints lasting 24 hours or less.
<b>Eye contact</b>	Zinc oxide can cause irritation, tearing and mild temporary pain.
<b>Ingestion</b>	Zinc oxide may cause vomiting, nausea, thirst, diarrhea and abdominal pain.
<b>Inhalation</b>	Zinc oxide dust is non- toxic if inhaled, except of a few reported cases of metal fume fever. Some workers develop a tolerance after repeated daily exposure to zinc oxide fume. This tolerance is lost after short periods away

**Skin Contact** from work.  
**Potential Environmental Effects** Zinc oxide may cause irritation to the skin.  
 Zinc Oxide has very low solubility in water and generally has no direct bioavailability. Refer to SECTION 15- REGULATORY INFORMATION.

<b>SECTION 3</b>	<b>COMPOSITION/INFORMATION ON INGREDIENTS</b>
------------------	---

<b>ZOCO (All Grades)</b>	Zinc Oxide	99 - 100%	CAS No. 1314-13-2
<b>ZOCO (Surface Treated Grades)</b>	Zinc Oxide	99 - 100%	CAS No. 1314-13-2
	Prop ionic Acid	0.1% - 0.5%	CAS No. 79-09-4

<b>SECTION 4</b>	<b>FIRST AID MEASURES</b>
------------------	---------------------------

**Eye Contact** Flush with warm running water for at least 15 minutes, including the eyelids to remove dust particle(s). If irritation persists seek medical attention.

**Skin contact** Remove contaminated clothing and wash affected area with soap and warm water. Seek medical attention if irritation develops or persists.

**Inhalation** Remove victim from exposure area to fresh air immediately. If breathing is difficult, medical oxygen may be administered, if available. If breathing has stopped, give artificial respiration and seek immediate medical attention.

**Ingestion** If irritation or discomfort occurs, obtain medical advice.

<b>SECTION 5</b>	<b>FIRE FIGHTING MEASURES</b>
------------------	-------------------------------

**Fire and Explosion Hazards** This material is not flammable.

**Extinguishing Media** Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical or foam.

**Fire Fighting** Zinc oxide fumes may be released in a fire involving zinc oxide. Fire fighters must be fully trained and wear full protective clothing including an approved, self- contained breathing apparatus which supplies a positive air pressure within a full face piece mask.

**Flash Point And Method** Not Applicable

**Upper And Lower Explosive Limit** Not Applicable

**Auto Ignition Temperature** Not Applicable

**Fire Extinguishing Agents** None; Material will not burn

**NFPA Ratings:** Health: 1, Fire: 0 & Reactivity: 0

**Hazard scale:** 0 = Minimum, 1= Slight, 2 = Moderate, 3 = Serious & 4 = Severe



**SECTION 6****ACCIDENTAL RELEASE MEASURES**

<b>Personal Precautions</b>	Remove soiled clothing and laundry before reuse. Avoid all skin contact with the spilled material. Use protective clothing, safety glasses, gloves and a respirator.
<b>Environmental Precautions</b>	Waste zinc oxide should be handled and disposed of in a manner which complies with local, state/provincial and federal regulations. Zinc oxide may cause adverse long-term effects in the aquatic environment. Keep out of sewers, ditches or drains.
<b>Clean- Up Procedures</b>	Small Spill - sweep up material for disposal or recovery. Large spills - Shovel material into containers. Thoroughly sweep area of spill to clean up any residual material. In case of large spills, follow the facility emergency response procedures.
<b>Spill Kit Information</b>	No specific spill kit required for this product
<b>Evacuation procedures</b>	Isolate the spill area to prevent people from entering it until the clean up is complete.

**SECTION 7****HANDLING AND STORAGE**

<b>Handling Procedures</b>	All employees who handle this material should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.
<b>Storage Procedures</b>	Zinc oxide gradually absorbs carbon dioxide upon exposure to air. Keep container tightly closed when not in use. Store containers in a cool dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store containers away from incompatible chemicals (refer to Section 10, Stability & Reactivity). Storage areas should be made of fire-resistant materials. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area. Empty containers may contain residual particles; therefore, empty container should be handled with care. Never store food, feed, or drinking water in containers, which held this product. Do not store this material in open or unlabeled containers.

**SECTION 8****EXPOSURE CONTROLS / PERSONAL PROTECTION****Exposure Guidelines**

Component: Zinc oxide (1314-13-2)

<b>ACGIH TWA</b>	2.0 mg/m <sup>3</sup> - total dust
<b>ACGIH STEL</b>	10.0 mg/m <sup>3</sup> - total dust
<b>OSHA PEL</b>	5.0 mg/m <sup>3</sup> – TWA respirable fraction
<b>OSHA PEL</b>	15.0 mg/m <sup>3</sup> – TWA total dust
<b>OSHA PEL</b>	5.0 mg/m <sup>3</sup> - TWA fume
<b>OSHA PEL</b>	10.0 mg/m <sup>3</sup> - STEL fume
<b>NIOSH REL</b>	5.0 mg/m(3) – TWA total dust
<b>NIOSH REL</b>	15.0 mg/m(3) - 15 minute ceiling

**Engineering Controls:** Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement. Provide dust collectors with explosion vents.

## Personal Protective Equipment

<b>Eyes/Face</b>	Wear safety glasses or goggles
<b>Skin</b>	Wear impervious gloves, boots and coveralls to avoid skin contact.
<b>Respiratory</b>	If airborne concentrations are above the applicable exposure limits, use NIOSH- approved respiratory protection.
<b>General hygiene consideration</b>	Wash thoroughly after handling and before eating or drinking. Have an eyewash fountain and safety shower available in the work area. Change work clothing after use.

### Protective Clothing Pictogram



## SECTION 9

## PHYSICAL & CHEMICAL PROPERTIES

<b>PH</b>	Not Applicable
<b>Odor</b>	No odour
<b>Color</b>	White
<b>Appearance</b>	Fine white solid powder
<b>Solubility</b>	0.00016 g / 100 ml cold water; soluble in acids and bases
<b>Evaporation rate</b>	Not Applicable
<b>Boiling Point</b>	Not Applicable
<b>Flammability</b>	Not Applicable
<b>Melting Point</b>	Sublimes at 1975 °C
<b>Vapor pressure</b>	Not Applicable
<b>Vapor Density (air = 1)</b>	Not Applicable
<b>Specific Gravity</b>	5.61
<b>Molecular Weight</b>	81.38
<b>Percent Volatile (20 °C)</b>	Nil

## SECTION 10

## STABILITY & REACTIVITY

<b>Chemical Stability</b>	Stable under normal conditions. Avoid heat & incompatible material
<b>Incompatibility</b>	Zinc oxide and chlorinated rubber reacts violently @ 215 deg C. Contact with magnesium and linseed oil can cause violent reaction. Contact with strong acids may cause vigorous reaction. Contact with strong bases will form water and soluble zincates. Contact between zinc oxide and hydrogen fluoride, aluminum + hexachloroethane, zinc chloride or phosphoric acid, and water should be avoided.
<b>Hazardous Decomposition</b>	None
<b>Hazardous Polymerization</b>	Will not occur

<b>SECTION 11</b>	<b>TOXICOLOGICAL INFORMATION</b>
-------------------	----------------------------------

Zinc Oxide dust is generally considered a nuisance dust and is not bio-accumulative. Dust can cause mild mechanical irritation to the eye. No skin irritation is expected from a single short-term exposure to this product. Ingestion of large doses may cause gastrointestinal irritation and vomiting. Inhalation of zinc oxide fume may cause metal fume fever, an illness that lasts less than 48 hours; the “no effect level” for induction of metal fume fever is in the range of 5 to 15 mg/m<sup>3</sup>.

<b>Carcinogenicity</b>	Not classified as to human carcinogenicity
<b>Epidemiology</b>	Not available
<b>Sensitization</b>	Not available
<b>Mutagenicity</b>	Zinc components have not been active in genetics assays
<b>Teratogenicity</b>	Zinc oxide at 2 to 38 mg/day had no effect on reproduction
<b>Corrosivity</b>	Not available
<b>Repeated dose effects</b>	Not available

<b>SECTION 12</b>	<b>ECOLOGICAL INFORMATION</b>
-------------------	-------------------------------

<b>Ecotoxicity</b>	It is very toxic to aquatic organisms. Since it takes very long time for zinc oxide to break down, it may cause adverse long-term effects in the aquatic environment.
<b>Degradability</b>	The products of degradation are less toxic than the product itself.

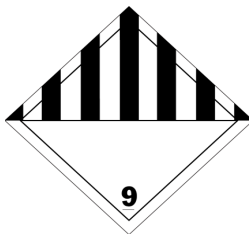
<b>SECTION 13</b>	<b>DISPOSAL CONSIDERATIONS</b>
-------------------	--------------------------------

The material does not have an EPA waste number and is not a listed waste. Keep out of sewers, ditches or drains. All wastes must be handled and disposed of in accordance with applicable regulations.

<b>SECTION 14</b>	<b>TRANSPORT INFORMATION</b>
-------------------	------------------------------

US HM-181	Not regulated
DOT Classification	Hazard class: XCP; NOT REGULATED FOR DOMESTIC TRANSPORT
TDG Classification	Not regulated
<b>IMO/IMDG</b>	<b>Not regulated</b>

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



Above markings are applicable to ICAO/IATA, EU ADR/ RID, AND/ADNR only.

**U.S Federal Regulation:**

TSCA (Toxic Substance Control Act) Status  
 TSCA (United States) the international ingredients of this product are listed  
 CERCLA RQ – 40 CFR 302.4(a): Not Listed  
 SARA 302 Components – 40 CFR 355 Appendix A: None  
 RCRA 261: TCLP Determination Pb, Cd  
 DOT 172: Not Regulated  
 FCC: Listed  
 Color: 73.1991, 2991  
 SARA 311/312: Yes (Acute)  
 SARA 313: Compounds: Zn, Pb  
 U.S. EPA Reg. No. 71645-3  
 U.S. EPA PC Code: 088502  
 U.S. TRI Reproductive Toxin – Yes  
 U.S. TRI Development Toxin - Yes

**Canada**

WHMIS Classification - not controlled  
 Domestic substance list (DSL) - listed

**European Union**

EC # 215-222-5  
 Zinc oxide is not considered environmentally hazardous outside of the EU.  
 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.  
 (Zinc Oxide) UN 3077, Class 9, PG III.  
 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.



The information published in this material safety data sheet has been compiled from our experience and data presented in various technical publications.

It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We reserve the right to revise material safety data sheets periodically as new information become available.

Legend for abbreviations

1. OSHA - Occupational Safety and Health Administration
2. PEL – permissible exposure limit
3. NIOSH - The National Institute for Occupational Safety and Health
4. REL - recommended exposure limits
5. ACGIH - The American Conference of Governmental Industrial Hygienists
6. TLV - threshold limit value
7. TWA – time waited average
8. STEL – short term exposure limit