



DIVISION OF HUDSON BAY MINING AND SMELTING CO., LIMITED

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)**



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Material Name: Zinc Oxide

SECTION 1	PRODUCT AND COMPANY IDENTIFICATION
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Product Identity	Zinc Oxide
Synonyms	Zinc White, Chinese white
Molecular Formula	ZnO
Trade Names	ZOCO
CAS Registry Number	1314-13-2
Manufacturer	Zochem, Division Of Hudson Bay Mining & Smelting Co., Limited 1 Tilbury Court, (P.O. Box 1120) Brampton, Ontario, Canada L6V 2L8
Emergency Telephone	1-905-453-4100 (Day) and 1-905- 453-6477 (Night)
Issue Date	Dec. 20, 07
Supersedes Date	Jan. 31, 2007

SECTION 2	HAZARDS IDENTIFICATION
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Emergency Overview	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.
OSHA Regulatory Status	This material is not hazardous. Please refer to Section 15, "Regulatory Information" for status with respect to various regulations.
Potential Health Effects	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 ³ 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 ³ 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.
Eye contact	Zinc oxide can cause irritation, tearing and mild temporary pain.
Ingestion	Zinc oxide may cause vomiting, nausea, thirst, diarrhea and abdominal pain.
Inhalation	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 from work.
Skin Contact	Zinc oxide may cause irritation to the skin.
Potential Environmental Effects	Zinc Oxide has very low solubility in water and generally has no direct bioavailability. Refer to SECTION 15- REGULATORY INFORMATION.

SECTION 3	COMPOSITION/INFORMATION ON INGREDIENTS
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ZOCO (All Grades)	Zinc Oxide	100%	CAS No. 1314-13-2
ZOCO (Surface Treated Grades)	Zinc Oxide	99.9%	CAS No. 1314-13-2
	Prop ionic Acid	0.1%	CAS No. 79-09-4

SECTION 4	FIRST AID MEASURES
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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.

SECTION 5	FIRE FIGHTING MEASURES
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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 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**

Personal Precautions	Remove soiled clothing and laundry before reuse. Avoid all skin contact with the spilled material. Use protective clothing, safety glasses, gloves and a respirator.
Environmental Precautions	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.
Clean- Up Procedures	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.
Spill Kit Information	No specific spill kit required for this product
Evacuation procedures	Isolate the spill area to prevent people from entering it until the clean up is complete.

SECTION 7**HANDLING AND STORAGE**

Handling Procedures	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.
Storage Procedures	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**

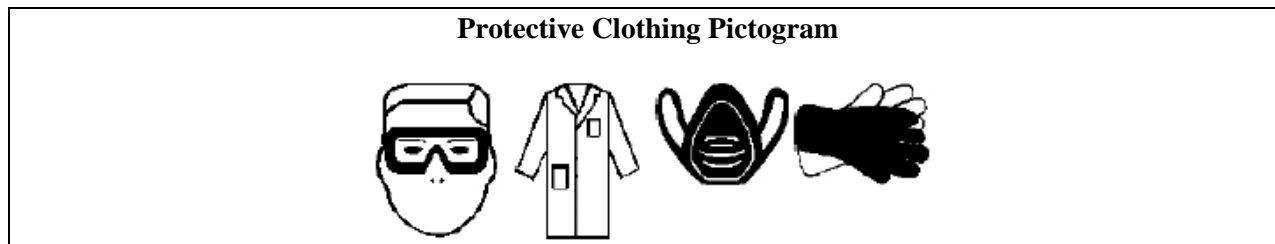
Component: Zinc oxide (1314-13-2)

ACGIH TWA	2.0 mg/m ³ - total dust
ACGIH STEL	10.0 mg/m ³ - total dust
OSHA PEL	5.0 mg/m ³ – TWA respirable fraction
OSHA PEL	10.0 mg/m ³ – TWA total dust
OSHA PEL	5.0 mg/m ³ - TWA fume
OSHA PEL	10.0 mg/m ³ - STEL fume
NIOSH REL	5.0 mg/m(3) – TWA total dust
NIOSH REL	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

Eyes/Face	Wear safety glasses or goggles
Skin	Wear impervious gloves, boots and coveralls to avoid skin contact.
Respiratory	If airborne concentrations are above the applicable exposure limits, use NIOSH- approved respiratory protection.
General hygiene consideration	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.



SECTION 9	PHYSICAL & CHEMICAL PROPERTIES
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Odor	No odour
Color	White
Appearance	Fine white solid powder
Solubility	0.00016 g / 100 ml cold water; soluble in acids and bases
Boiling Point	Sublimes (at ~1400°C)
Melting Point	1975 °C
Vapor pressure	Not Applicable
Vapor Density (air = 1)	Not Applicable
Specific Gravity	5.61
Molecular Weight	81.38
Percent Volatile (20 °C)	Nil

SECTION 10	STABILITY & REACTIVITY
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Chemical Stability	Stable under normal conditions. Avoid heat & incompatible material
Incompatibility	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.
Hazardous Decomposition	None
Hazardous Polymerization	Will not occur

SECTION 11**TOXICOLOGICAL INFORMATION**

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/m³.

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

SECTION 12**ECOLOGICAL INFORMATION**

Ecotoxicity	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.
Degradability	The products of degradation are less toxic than the product itself.

SECTION 13**DISPOSAL CONSIDERATIONS**

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.

SECTION 14**TRANSPORT INFORMATION**

US HM-181	Not regulated
DOT Classification	Hazard class: XCP; NOT REGULATED FOR DOMESTIC TRANSPORT
TDG Classification	Not regulated
IMO/IMDG	Not available
ICAO/IATA	Not available
EU ADR:	UN3077 Environmentally hazardous substance, solid, n.o.s (zinc oxide), 9, III

SECTION 15**REGULATORY INFORMATION****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

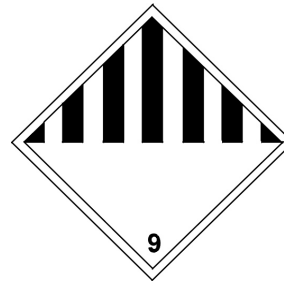
DOT 172: Not Regulated
FCC: Listed
Color: 73.1991, 2991
SARA 311/312: Yes (Acute)
SARA 313: Compounds: Zn, Pb

Canada

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

European Union

EC # 215-222-5
UN3077 environmentally hazardous substance, solid, n.o.s. (Zinc oxide),9,III. - this is applicable for European Union (EU) countries only. Zinc oxide is not considered environmentally hazardous outside of EU countries.
Ingredients listed on the European inventory of existing commercial Chemical substances (EINECS).....Yes



SECTION 16

OTHER INFORMATION

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

P.O. Box 1120, Brampton, Ontario, Canada L6V 2L8