



**MATERIAL SAFETY DATA SHEET**  
COMPLIES WITH 29 CFR 1910.1200.  
OSHA HAZARD COMMUNICATION RULE

**DATE OF LAST REVISION: 5-18-07**

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## CHEMICAL IDENTITY

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LABEL IDENTITY	<b>ZINC OXIDE</b>
CHEMICAL NAME/SYNONYMS	<b>ZINC OXIDE</b>
FORMULA	<b>ZnO</b>
CHEMICAL FAMILY	<b>METAL OXIDE</b>
MOLECULAR WEIGHT	<b>91.38</b>
CAS REGISTRY NUMBER	<b>1314-13-2, LISTED IN THE TSCA INVENTORY</b>
HAZARDOUS INGREDIENTS	<b>ZINC OXIDE</b>
%: <b>100</b> TLV: <b>15mg/m3</b> OSHA/PEL: <b>10mg/m3</b> OTHER: <b>5mg/m3-resp</b>	

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## PHYSICAL AND CHEMICAL PROPERTIES

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COLOR, FORM AND ODOR	<b>White to yellowish powder and pieces, no odor</b>
BOILING POINT	<b>NE or NA</b>
DENSITY (gm/cc)	<b>NE or NA</b>
VAPOR PRESSURE @ 20°	<b>NE or NA</b>
% VOLATILE BY VOLUME (%)	<b>NE or NA</b>
REACTION WITH WATER	<b>NE or NA</b>
EVAPORATION RATE (H2O=1)	<b>NA</b>
SOLUBILITY IN WATER	<b>Insoluble</b>
MELTING POINT	<b>1975.0°C</b>

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## FIRE AND EXPLOSION HAZARD DATA

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FLASH POINT	<b>NE or NA</b>
AUTOIGNITION TEMPERATURE (° C)	<b>NA</b>
FLAMMABILITY	<b>Non-flammable</b>
EXTINGUISHING MEDIA	<b>Use suitable extinguishing media for surrounding materials and type of fire.</b>
SPECIAL FIRE FIGHTING PROCEDURES	<b>Fire fighter must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes</b>
UNUSUAL FIRE & EXPLOSION HAZARDS	<b>Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.</b> <b>When heated to decomposition, zinc oxide may emit toxic fumes of ZnO. May explode when mixed with chlorinated rubber. Violent reaction with magnesium, linseed oil.</b>



## ZINC OXIDE MATERIAL SAFETY DATA SHEET

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### HEALTH HAZARD INFORMATION

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TOXICITY DATA **Please see attached sheet**

HMIS RATING:

HEALTH: **3** FLAMMABILITY: **0** REACTIVITY: **0** PERSONAL PROTECTION: **H**

ROUTES OF ENTRY

INHALATION: **Yes**  
SKIN: **No**  
INGESTION: **Yes**  
EYES: **No**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: **Pre-existing Respiratory Disorders**

HEALTH HAZARDS (acute and chronic):

**Zinc compounds have variable toxicity, but generally are of low toxicity. Zinc is not inherently a toxic element. However, when heated, it evolves a fume of zinc oxide which, when inhaled fresh, can cause a disease known as "brass founders" "ague" or "brass chills". Zinc oxide dust which is not freshly formed is virtually innocuous. There is no cumulative effect from the inhalation of zinc fumes. (Sax, Dangerous Properties of Industrial Materials, eight edition).**

INHALATION:

Acute: **may cause respiratory tract irritation with nasopharyngitis and laryngitis.**

Chronic: **may cause human systemic effects.**

INGESTION:

Acute: **moderately toxic by ingestion.**

Chronic: **No chronic health effects recorded.**

SKIN:

Acute: **may cause irritation.**

Chronic: **no chronic health effects recorded.**

EYE:

Acute: **may cause irritation.**

Chronic: **no chronic health effects recorded.**

Target organs: **no target organs recorded.**

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CARCINOGENICITY: NTP: **No** IARC MONOGRAPHS: **No** OSHA REGULATE: **No**

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SIGNS AND SYMPTOMS OF OVEREXPOSURE:

INHALATION: **may cause sweet taste, throat dryness, coughing, weakness, generalized aches, chills, fever, nausea and vomiting. Human systemic effects include metal fume fever with chills, fever, tightness of chest, cough, dyspnea and other pulmonary changes.**

INGESTION: **may cause coughing, shortness of breath and sweating.**

SKIN: **may cause redness and itching.**

EYES: **may cause redness, itching and watering.**



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### HEALTH HAZARD INFORMATION CONTINUED

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#### EMERGENCY AND FIRST AID PROCEDURES:

**INHALATION: remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention.**

**INGESTION: give 1-2 glasses of milk or water and induce vomiting; seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.**

**SKIN: remove contaminated clothing; brush material off skin; wash affected area with mild soap and water; seek medical attention if symptoms persist.**

**EYE: flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.**

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### REACTIVITY DATA

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STABILITY	<b>Stable</b>
CONDITIONS CONTRIBUTING TO UNSTABILITY	<b>None</b>
INCOMPATIBILITY (MATERIALS TO AVOID)	<b>(Aluminum, hexachloroethane), chlorinated rubber, linseed oil, magnesium)</b>
HAZARDOUS DECOMPOSITION PRODUCTS	<b>Zinc Oxide</b>
HAZARDOUS POLYMERIZATION	<b>Will Not Occur</b>
CONDITIONS TO AVOID	<b>None</b>

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### SAFE HANDLING AND USE

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**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wear appropriate respiratory and protective equipment specified in section VIII-control measures. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.**

#### WASTE DISPOSAL METHOD:

**Consult federal, state and local regulations for proper disposal procedure.**

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### SPECIAL PROTECTIVE INFORMATION

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RESPIRATORY PROTECTION	<b>NIOSH approved respirator</b>
LOCAL EXHAUST	<b>Maintain at or below PEL, TLV</b>
MECHANICAL (general)	<b>Recommended</b>
PROTECTIVE GLOVES	<b>Impervious Gloves</b>
EYE PROTECTION	<b>Safety glasses</b>
OTHER PROTECTIVE EQUIPMENT	<b>Wear protective clothing to suitable to prevent contamination of skin and clothes.</b>



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### SPECIAL PRECAUTIONS

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**WORK/HYGIENIC/MAINTENANCE PRACTICES: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do Not Use tobacco or food in work area. Wash thoroughly before eating and smoking. Do Not blow dust off clothing or skin with compressed air.**

**HAZARD LABEL INFORMATION: store in cool, dry area, store in tightly closed containers, wash thoroughly after handling.**

**ADDITIONAL COMMENTS: Some of the chemicals listed herein are research or experimental substances which may be toxic, as defined by various governmental regulations. In accordance with Environmental Protection Agency regulations and the Toxic Substance Control Act (TSCA), these materials should only be handled by or under the direct supervision of, a "technically qualified individual", as defined in 40 CFR 710.32(aa).**

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THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

**NA= NOT APPLICABLE**

**ND= NO DATA FOUND**

**NE=NOT ESTABLISHED**



## ATTACHED SHEET FOR ZINC OXIDE

### TOXICITY DATA:

skn-rbt	<b>500mg/24H MLD</b>
dnd-esc	<b>3000 ppm</b>
orl-rat TDLO	<b>6846mg/kg (1-22D preg): REP</b>
eye-rbt	<b>500mg/24H MLD</b>
cyt-rat-ihl	<b>100ug/m3</b>
orl-rat TDLO	<b>6846mg/kg (1-22D preg): TER</b>
orl-hmn LDLO	<b>500mg/kg</b>
ipr-rat LD50	<b>240mg/kg</b>
ihl-mus LC50	<b>2500mg/m3</b>
ihl-hmn TCLO	<b>600mg/m3:PUL</b>
orl-mus LD50	<b>7950mg/kg</b>