American Zinc, LLC
1160 Paige Avenue NE
Warren, OH, 44483 USA
info@american-zinc.com
Ph: +1 (803)-729-1309

MATERIAL SAFETY DATA SHEET (MSDS)

ZINC OXIDE

SCOPE

This MSDS is compliant with the Global Harmonized System (GHS) of Classification and Labeling of Chemicals, and regulations for United States, Canada, and Mexico. This MSDS is only for use in these countries.

SECTION 1: IDENTIFICATION OF THE SUBSTANCE

1.1 Product Identifier / Product name: ZINC OXIDE

1.2 Relevant identified uses of the substance/mixture and uses advised against.

Uses include:

- Rubber and elastomer compound
- Paints, pigments, and inks
- Other zinc chemicals
- Plant fertilizers
- Animal feed
- Semiconductors
- Fuel and fuel additives
- Lubricants and oil additives
- Plastic compounds
- Zinc plating and corrosion inhibitors

No uses that the product is advised against

1.3 Manufacturer/Supplier of this material safety data sheet:

American Zinc, LLC
1160 Paige Avenue NE
Warren, OH, 44483 USA
info@american-zinc.com

1.4 Emergency Contact: Hiren Desai Ph: +1 803-729-1309

SECTION 2: HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture:

Zinc Oxide is not classified or hazardous for the jurisdictions covered by this MSDS (see above "SCOPE").

GHS markings are not required.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1	Constituent/Ingredient	Range	CAS no.	EC/EINECS
	Zinc Oxide (ZnO)	99-100.0%	1314-13-2	215-222-5

3.2 Impurities:

The product contains de minimis amount of naturally occurring inorganic impurities (technical data sheets and certificate of analysis is provided with each supply)

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures:

In case of skin contact:	Wash immediately with soap and water.
In case of eye contact:	Flush eyes with plenty of water and seek medical advice if irritation occurs.
In case of Ingestion:	Drink plenty of water; do not induce vomiting. Call a physician.
In case of Inhalation:	Move to fresh air. Keep warm and seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed:

Acute:	Dry cough, headache.
Chronic:	None (overexposure has no lasting effects).

4.3 Indication of any immediate medical attention and special treatment needed:

Condition:	Bad cough or headache.
Treatment:	Move person to fresh air. No special treatment known.

SECTION 5: FIRE-FIGHTING MEASURES

Zinc oxide will not burn. It does not decompose into any hazardous product(s).

Use extinguishing media appropriate for the surrounding fire. Avoid release of fire control water containing zinc oxide to the environment.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

Wear protective clothing, dust respirator, and goggles in bulk excess dust conditions. Shovel up spills into appropriate labeled container. Dry spills, not mixed with other chemicals, may be recyclable. Contact American Zinc.

6.2 Environmental precautions: Avoid release to the environment.

6.3 Methods and material for containment and cleaning up:

Recover the product by vacuum. If sweeping unavoidable, use soft bristles to reduce creation of airborne dust.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

Wear protective clothing, dust respirator and mask, and safety goggles in bulk excess dust conditions.

7.2 Conditions for safe storage, including any incompatibilities:

Keep dry.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters:

United States (Ingredient name: Zinc oxide)

NIOSH REL (United States, 10/2013) CEIL: 15 mg/m³ Form: Dust TWA: 5 mg/m³ 10 hours. Form: Dust and fumes	OSHA PEL (United States, 2/2013) TWA: 5 mg/m³ 8 hours. Form: Fume TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust STEL: 10 mg/m³ 15 minutes. Form: Respirable fraction
ACGIH TLV (United States, 4/2014) STEL: 10 mg/m³ 15 minutes. Form: Fume TWA: 2 mg/m³ 8 hours. Form: Respirable fraction	

Canada (Ingredient name: Zinc oxide)

	TWA (8 hr) mg/m3	STEL (15 min) mg/m3	Note
US ACGIH 4/2014	2	10	Respirable fraction
ON 1/2013	2	10	Respirable fraction
QC 1/2014	5	10	Fume
AB 4/2009	2	10	Respirable fraction
BC 7/2013	2	10	Respirable fraction

Mexico (Ingredient name: Zinc oxide)

NOM-010-STPS (Mexico, 9/2000).
LMPE-PPT: 10 mg/m³ 8 hours. Form: powder
LMPE-CT: 10 mg/m³ 15 minutes. Form: smoke
LMPE-PPT: 5 mg/m³ 8 hours. Form: smoke

8.2 Personal Protection Exposure Controls

Exposure routes: 1. Inhalation. 2. Skin. 3. Eyes. 4. Digestion.

Recommendations:

Eyes:	Use safety glasses in bulk dusk conditions
Skin:	Use long sleeves in bulk dust conditions
Hands:	Use gloves to reduce drying of skin
Respiratory:	Use dust filter masks or respirators in bulk dust conditions. Must wear a suitable respirator if exposure above 8 hour TWA PEL

8.3 Appropriate engineering controls: Ensure local exhaust ventilation.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 1013 hPa:	Solid, powder
Odor / smell:	Odorless.
Odor threshold:	Not applicable.
Color:	White, off white, cream, grayish, or yellowish.
pH:	Neutral, 6.8 to 8 (7.37 nominal)
Vapour pressure:	Not applicable (melting point above 300°C).
Vapour density:	Not applicable.
Relative density/Specific Gravity:	5.68 g/cm3.
Water solubility:	Negligible (solubility of Zn in ZnO is 2.9 mg/l).
Soluble:	In bases and acids.
Boiling point:	Not applicable; Decomposes before boiling.
Flash point:	Not applicable to inorganic substances.
Evaporation rate:	Not applicable to solids
Partition coefficient n-octanol-water:	Not applicable to inorganic substance.
Flammability:	Not flammable. Will not burn.
Auto-ignition temperature:	Not auto-flammable.
Upper / lower flammability limits:	Not applicable.
Upper / lower explosive limits:	Not applicable.
Melting / Freezing point:	Will not freeze. Will not melt. Malleable above 300C/572F No exothermic or endothermic peaks are observed. No oxidation or decomposition observed. Sublimation temperature 1975 Celcius.
Decomposition temperature:	Not applicable.

Viscosity:	Not applicable.
Explosive properties:	Zinc oxide is not flammable, explosive or self-flammable
Granulometry:	D50 1.05 µm, D80 = 8.0 m2/g surface area, rubber applications, and product stored under roof only.

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	Stable under normal, dry air conditions.
Chemical stability:	Product is stable.
Possibility of hazardous reactions:	None.
Conditions to avoid:	Keep dry
Incompatible materials:	Heated magnesium. Chlorinated rubber above 215C.
Hazardous decomposition:	None.
Decomposition:	Product decomposes in acids and bases.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects for zinc oxide:

Route	Oral, inhalation
Acute toxicity	LD50 (rat, Inhalation): 7,950 mg/kg (Source: Encyclopedia of Toxicology: Reference Book 2005)
Chronic toxicity	NOAEL: 50 mg/day (based on human clinical studies)
Carcinogenicity	Not listed as an IARC Carcinogen. Not listed in the NTP report on carcinogens.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity:

Product	Result	Species	Dose	Exposure	Reference
Zinc Oxide	LC50 inhalation of dust & mist	Rat	>5.7mg/L	4 hours	Klimisch and Freisberg (1982)
Zinc Oxide	LD50 oral	Rat	15000mg/kg	N/A	Löser (1972)
Zinc Oxide	LD50 oral	Rat	>5000mg/kg	N/A	Löser (1978)

With LD50 values consistently exceeding 2,000 mg/kg bw, slightly soluble compounds such as, zinc oxide (LD50 ranges between 5,000 and 15,000mg/kg bw) show low level of acute oral toxicity, not leading to classification for acute oral toxicity.

Zinc oxide is shown to be of low acute inhalation toxicity (i.e., LC50 values of > 5.7 mg/L/4hrs), not leading to classification for acute inhalation toxicity

12.2	Persistence and degradability:	N/A, zinc is an element
12.3	Bioaccumulative potential:	N/A, ZnO does not bioaccumulate or biomagnify
12.4	Mobility in soil:	N/A
12.5	Results of PBT and vPvB assessment:	Zinc oxide is not PBT or vPvB.
12.6	Other adverse effects:	None

SECTION 13: DISPOSAL CONSIDERATIONS

13.1	USEPA law:	Waste zinc oxide must be TCLP testing to determine proper disposal classification. Substance will generally pass TCLP.
13.2	State law:	Material may be regulated locally as industrial or special waste.
13.3	Recyclable:	Waste material not co-mingled with other substances may be recyclable. Contact American Zinc, LLC for further information. This material, if sent for recycling, is exempt from U.S. Federal, State, and local waste regulations and TRI transfer reporting. Empty used packaging is not regulated waste.

SECTION 14: TRANSPORT INFORMATION

Zinc Oxide is not classified or hazardous for the jurisdictions covered by this MSDS (U.S., Canada, and Mexico). GHS markings are not required.

SECTION 15. REGULATORY INFORMATION

15.1 U.S. Regulations:

Transportation:	Not transport regulated in the U.S. (USDOT 49CFR172), Canada, or Mexico. HS Tariff Class #: 2817.00.0000, preference B
SARA 302:	Name listed (zinc). RQ=None, TPQ=None.
SARA 312:	Yes, acute, EPCRA Tier 2 must be filed with state and local agencies.
SARA 313:	Yes, TRI on Form R must be filed for Zn & Pb Compounds if usage above threshold.
CA Prop. 65:	No, zinc oxide is not a Prop 65 listed substance. List impurities Pb & Cd.
CAA 112, 61 HAP:	No, not regulated, no Hazardous Air Pollutants (HAP's)
FIFRA 152 et seq.:	No, product is not subject to FIFRA registration.
CERCLA 102/103:	Zinc is on Name List, RQ=None.
CONEG:	Compliant.
ODS/ODC 82:	No ozone depleting substances.

15.2 TSCA and equivalent inventories/lists:

TSCA (U.S.):	Yes, listed, active, notification not required.
DSL (Canada):	Yes, listed.
NDSL: (Canada):	No, not listed, notification not required.
SVHC:	Zinc oxide is not an SVHC. Impurities are below SVHC or candidate SVHC thresholds.
Nano:	This product is not nano (defined as 50% particles <=100nm).

SECTION 16: OTHER INFORMATION

16.1 HMIS Hazard Rating (Paint and Coating Industry)

Health	1 (slight)
Flammability	0
Reactivity	0
Personal Protection	E (mask, gloves, and goggles are recommended in bulk dust conditions)

16.2 This MSDS provides information to work safety with ZnO substance. It is not a performance or property guarantee. The information is believed accurate utilizing reasonably available published data. American Zinc is not responsible for any inadvertent error or omission.