

SAFETY DATA SHEET



ZINC OXIDE LLC

ZINC OXIDE

Effective Date 01June2015

Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier / Product name: ZINC OXIDE

This SDS is valid for all zinc oxide product codes or grades

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

Common uses include:

- Rubber compound
- Colouring agents, pigments
- Food/feedstuff additives
- Fuels and fuel additives
- Intermediates
- Laboratory chemicals
- Lubricants and lubricant additives
- Plating agents and metal surface treating agents
- Process regulators, other than polymerisation or vulcanisation processes
- Component in batteries
- Corrosion inhibitors and anti-scaling agents
- Fertilizers
- Pharmaceutical substance
- Photosensitive agents and other photo-chemicals
- Process regulators, used in vulcanisation or polymerisation processes
- Processing aid, not otherwise listed
- Semiconductors

No uses advised against

1.3 Details of the supplier of the safety data sheet:

Zinc Oxide LLC

600 Printwood Drive

Dickson, TN 37055-3010 U.S.A.

Contact: John Stourac, Director – Technical, ES&H, mobile +1 312-813-4620

website: zn-oxide.com

Section 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture: Zinc Oxide is not regulated in North America.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>3.1 Constituent/Ingredient</u>	<u>Range</u>	<u>CAS no.</u>	<u>EC/EINECS</u>	<u>Other</u>
Zinc Oxide (ZnO)	100%	1314-13-2	215-222-5	

3.2 Additional information of impurities

During post manufacturing material handling & storage, product acquires some moisture & carbonate.
Product may contain processing aid treatment additive at customer request.
Other naturally occurring impurities below SDS threshold limits.

Section 4: FIRST AID MEASURES

4.1 Description of first aid measures:

In case of skin contact: Wash with soap and water.
In case of eye contact: Rinse with plenty of water and seek medical advice.
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 at rest.

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.

Section 5: FIRE-FIGHTING MEASURES

Zinc oxide will not burn.
Hazardous decomposition product(s): None.
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 ZNO LLC.

6.2 Environmental precautions:

Avoid release to the environment.

6.3 Methods and material for containment and cleaning up:

Recover the product with a vacuum cleaner or a damp cloth.
Avoid sweeping to reduce creation of airborne dust.

Section 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

Wear protective clothing, dust respirator, and 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:

OSHA Table Z substance:	8 hour-TWA:
Zinc Oxide	5 mg/m ³ (fumes) 15 mg/m ³ (dust; total) 5 mg/m ³ (dust; respirable)

8.2 Exposure controls

Eye protection:	Recommended in bulk dust conditions.
Protection for skin:	Recommended in bulk dust conditions.
Protection for hands:	Recommended to reduce drying of skin
Respiratory protection:	Wear in bulk dust conditions or when above PEL
Local exhaust ventilation:	Yes.
Thermal Hazards:	None

8.3 Route(s) Of Entry:

1. Inhalation. 2. Dermal. 3. Eyes. 4. Digestion.

Carcinogens: Not a NTP/IARC carcinogen.

Signs & Symptoms of Exposure: Dry throat, cough, dry itching skin.

Human: Acute: Excess bulk exposure may cause acute irritation.

Chronic: No chronic risk know.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance at 20°C and 1013 hPa:	Solid, powder or pellets
Odor / smell:	Odorless.
Color:	White, off white, cream, greyish, or yellowish.
Flash point:	Not applicable to inorganic substances.
Flammability:	Not flammable. Will not burn.
Sublimation:	1975 C (3587 F)
Auto-ignition temperature:	The substance is not auto-flammable.
Upper / lower flammability limits:	Not applicable.
Upper / lower explosive limits:	Not applicable.
Evaporation rate:	Not applicable to solids
Vapour pressure:	Not applicable (melting point above 300°C).

Vapour density:	Not applicable.
Relative density/Specific Gravity:	5.68 g/cm ³ .
Water solubility:	Negligible (solubility of Zn in ZnO is 2.9 mg/l).
Soluble:	In bases and acids
Partition coefficient n-octanol-water:	Not applicable to inorganic substance.
Decomposition temperature:	Not applicable.
Viscosity:	Not applicable.
Granulometry:	D50 1.05 µm, D80 <20 µm
Molecular Weight:	81.38 (ZnO)
pH:	Neutral, 6.8 to 8 (7.37 nominal)
Boiling point:	Not applicable; the substance decomposes before boiling.
Melting / Freezing point:	Will not freeze. Will not melt.*
	No exothermic or endothermic peaks are observed.
	No oxidation or decomposition was observed.
	*Malleable with other oxides at 1975 C

Section 10. STABILITY AND REACTIVITY

10.1	Reactivity:	Stable under normal dry air conditions
10.2	Chemical stability:	Product is stable.
10.2.1	Decomposition:	Product decomposes in bases and acids, neutralizing pH.
10.3	Possibility of hazardous reactions:	None
10.4	Conditions to avoid:	Keep from getting wet (will damage substances usefulness).
	Incompatible materials:	Heated magnesium. Chlorinated rubber above 215C.
10.5	Hazardous decomposition:	None.
10.6	Shelf life:	One year from date of manufacturing*
	*Zinc oxide (ZnO) slowly reacts with carbon dioxide (CO ₂) in ambient air forming zinc carbonate (ZnCO ₃). After one year, carbonate degradation may cause excess +45 µm hard particulates and reduced ZnO assay failing product quality testing.	

Section 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects for zinc oxide:

Acute toxicity:*

Result	Species	Dose	Exposure	Refs
LC50 Inhalation Dusts and mists	Rat	>5.7 mg/L >5700 mg/m ³	4 hours	Klimisch and Freisberg (1982)
LD50 Oral	Rat	15000 mg/kg	NA	Löser (1972)
LD50 Oral	Rat	>5000 mg/kg	NA	Löser (1977)

*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.

Sensitization:	No sensitizing effects known (Van Huygevoort, 1999 g, h)
Germ cell mutagenicity:	No biologically relevant genotoxic activity.
Carcinogenicity:	None.
Aspiration hazard:	Not available
Routes of entry:	Oral, Inhalation.
Chronic toxicity:	NOAEL: 50 mg/ Zn/day (based on human clinical studies).
Reproduction toxicity:	No evidence of reproduction toxicity.
Acute toxicity – Dermal:	No data available.
Aspiration hazard:	No data available
Respiratory tract:	Not irritant (Klimish et al, 1982)
Skin irritation:	Not irritating (rabbit). OECD 404. (Löser, 1977; Lansdown, 1991)
Eye irritation:	Not irritating (rabbit). (Van Huygevoort 1999; Thijssen, 1978; Löser, 1977)
Ingestion:	None (substance is used as a human supplement).
Specific target organ toxicity (repeated exposure):	None. (Lam et al, 1985, 1988; Conner et al. 1988).
Specific target organ toxicity (single exposure):	None. (Heydon and Kagan, 1990; Gordon <i>et al.</i> , 1992; Mueller and Seger, 1985).

Section 12: ECOLOGICAL INFORMATION

12.1 Toxicity:

Acute EC50 0.413 mg/l Zn, 48 hour – *Ceriodaphnia dubia*

Acute LC50 0.136 mg/l Zn, 72 hour – *Selenastrum capricornutum*

62% solubilisation capacity at 1 mg/l at pH 8:

for pH <7: 0.67 mg Zn/l (based on 48 hr *Ceriodaphnia dubia* test cfr. above).

for pH >7-8.5: 0.21 mg Zn/l (based on 72 hr *Selenastrum capricornutum* test cf. above)

12.2 Persistence and degradability:	N.A., zinc is an element
12.3 Bioaccumulative potential:	N.A., no bioaccumulate or biomagnify
12.4 Mobility in soil:	N.A.
12.5 Results of PBT and vPvB assessment:	N.A., zinc oxide is not PBT or vPvB.
12.6 Other adverse effects:	None

13. DISPOSAL CONSIDERATIONS

13.1 USEPA law: Waste zinc oxide must be TCLP testing to determine proper disposal classification.

Substance will generally pass TCLP.

State law: Material may be regulated locally as industrial or special waste.

Recyclable: Waste material not co-mingled with other substances may be recyclable. Contact Zinc Oxide 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

This material is not USDOT Transportation regulated.

Section 15. REGULATORY INFORMATION

15.1 U.S. Regulations:

USDOT, TDG (Canada), Mexico: Not transport regulated
HS Tarriff Class #: 2817.00.0000, preference B
SARA 302: Name listed (zinc). RQ=None, TPQ=None.
SARA 312: Yes, acute hazard, 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.
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.
Prop 65: No chemical ingredients on this SDS are regulated by CA Proposition 65.
ODS/ODC 82: No ozone depleting substances.
TSCA: Yes, on Inventory. Notification not required.
USFDA: USFDA Registered. Listed as GRAS at 21CFR182.8991 (GRAS=Generally Recognized as Safe). Authorized for use as an ingredient in food contact: Rubber 21cfr177.2600(c)(1); Food can linings/coatings 21cfr175.300(b)(2), Plastics 21cfr177.1010(a)

15.2 European Economic Area (EEA) Regulations:

REACH (EEA): 17-2120064320-70-0000 REACH Pre-Registration valid for tonnage band till June 1, 2018. OR information: ROR, U.K., +44(0) 1565 724241, email: alerts@RORltd.com.
Transportation: This product is transport regulated in the EU/EEA member countries. Listed by regulation.

15.3 TSCA equivalent 'inventory' regulations in other countries:

DSL = Yes
NDSL = No
EINECS = Yes, on Inventory
ELINCS = No (notification/reporting not required)
ASIA-PAC = Yes; AICS = Yes; SWISS = YES; PICCS = Yes.

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 SDS 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. We are not responsible for any inadvertent error or omission.

