



MATERIAL SAFETY DATA SHEET

SECTION 1. Product Identity and Responsible Party
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Product Name: ZINC OXIDE	Synonyms: Chinese White, ZnO, AZO, Red Seal, White Seal.
Chemical Formula: ZnO	

CAS number: 1314-13-2	Product Grades: All commercial quality Product Grades
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Distributed By: Saffire Blue Inc. 1444 Bell Mill Road Tillsonburg, ON N4G4G9 Canada	Use of the substance/preparation: chemical or raw material for use in rubber compounding, polymers, plastics, zinc chemicals, paints & coatings, electronics, catalysts, lubricants, pharmaceuticals, cosmetics, animal feed, fertilizer, ceramics.
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Date Revised: August 03, 2011	
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SECTION 2. Composition/Information on Ingredients
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Substance/Preparation has no human health hazard.
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Occupational Exposure Limit(s), if available, are listed in Section 8.

Component	CAS No.	% Range
Zinc Oxide, as ZnO (dry)	1314-13-2	99.8 – 100 (1) Naturally occurring impurities. Trace levels vary with grade. (2) ZnCO ₃ natural shelf life degradation (3) Processing aid/coating added per customer request
Lead, as PbO (1)	1317-36-8	
Cadmium, as CdO (1)	1306-19-0	
Zinc Carbonate (2)	5970-47-8	
Zinc Propionate (3)	557-28-8	

SECTION 3. Hazards

Route(s) Of Entry: 1. Inhalation. 2. Mechanical irritation to skin and eyes.

Carcinogens: Not a NTP/IARC carcinogen.
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Signs & Symptoms of Exposure: Dry throat, cough, dry itching skin.

Human: Excess bulk exposure may cause acute respiratory irritant or dry skin. No chronic hazards.
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Metal Fume Fever: Excessive inhalation exposure within hours of ZnO formation may cause 'metal fume fever.' Symptoms are chills, metallic taste, severe headache. This hazard only exists at the manufacture and not in later handling or use. Symptoms often persist 24 hours. See Section 4, First Aid.
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Other Human hazard reports: Some users request ZnO with addition of processing aid additives or coatings, most commonly <0.1% content propionic acid, caprylic acid, or mineral oil. Acid content may increase exposed skin irritation. An internet search noted alleged dermatitis or oxide pox with oxides, however, this preparer finds no cases in reputable medical literature data of such conditions caused by zinc oxide products covered by this MSDS. Less than commercial quality, or tech grade, zinc oxide may contain additional impurities requiring exposure considerations not covered by this MSDS.
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Environmental: ZnO is not water soluble. However if chemically in solution, the net Zn in certain situations is toxic to a limited group of aquatic organisms.

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SECTION 4. FIRST AID PROCEDURES	
First Aid:	Remove person from exposure.
Inhalation:	Move to fresh air. Consult physician if acute symptoms persist.
Skin Contact:	Wash with soap and water. Restore oil with lotion if necessary.
Ingestion:	Drink water. Consult physician if complaints persist.
Eye Contact:	Flush with water. Consult physician if acute symptoms persist.
Protection of First Responders: Wear suitable respirator if bulk dusty conditions exceed permissible exposure levels listed in Section 8. Wear additional protection for personal comfort as conditions warrant.	

SECTION 5. FIRE, EXPLOSION AND FIRE FIGHTING DATA	
Flash Point: Product is a solid (powder form), is non-combustible, and will not burn.	Extinguishing Media: Use extinguishing media based on surrounding materials. Avoid release of fire control water to environment.
	Hazardous (de)composition Product(s): None

SECTION 6. ACCIDENTAL RELEASE MEASURES	
If spilled, shovel or sweep spills into suitable labeled container. Vacuum small spills. Spills not mixed with other chemicals may be recyclable - contact U. S. Zinc for further information. See Section 13 for disposal information.	

SECTION 7. HANDLING AND STORAGE	
Storage: Keep dry. To minimize carbonation (and resulting potency degradation), store in lower humidity, and keep closed in original containers until ready for use. Once opened, minimize dusting to reduce human and environment exposure.	
Handling: Follow good practices to control and avoid exposure to nuisance dust. See Section 8.	

SECTION 8. EXPSURE CONTROLS, PERSONAL PROTECTION	
Respiratory protection:	Recommended. Use NIOSH approved dust filter respirator.
Ventilation:	Local exhaust recommended.
Protective gloves:	Recommended. Any glove type offering comfort is suitable. Breakthrough time = not applicable
Protective clothing:	Recommended in bulk dust conditions.
Eye Protection:	Recommended.

U. S. OSHA Occupation Exposure Limits/Recomendations				
Hazardous Component	CAS	% Range	ACGIH TLV/	OSHA PEL
Zinc Oxide, as ZnO (dry)	1314-13-2	99.8 – 100	5 mg/m3*	5 mg/m3*
Lead, as PbO (1)	1317-36-8			50 ug/m3
Cadmium, as CdO (1)	1306-19-0			5 ug/m3
Zinc Propionate (2)	557-28-8	<0.1% (2)		
(1) PbO & CdO are naturally occurring impurities, % Range varies with grade. (2) Processing aid additive/coating added at customer request.				*Respirable fraction

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SECTION 9. PHYSICAL AND CHEMICAL CHARACTERICS	
Boiling Point: Not applicable	Vapor Pressure: @1500C = 12mm Hg
Melting Point: 1975 C	Evaporation Rate: N/A (Butyl Acetate = 1)
Specific Gravity: 5.68	Solubility In Water: Insoluble (negligible, <2mg/l)
Molecular Weight: 81.38 (ZnO)	Soluble: In bases and acids
Oxidation qualities: Not applicable	Fire qualities: Will not burn
Odor, smell: Odorless.	pH: 7 to 8 (7.37 nominal)
Vapor Density: Not applicable	Physical State: Powder or pellets
Typical particle size: <=1 Micron	Appearance: White, cream, or yellowish color
Explosive: Not explosive	Volatile: 0.3% nominal (due to loss of H2O or CO2)

SECTION 10. STABILITY AND REACTIVITY DATA	
Stability: Stable under normal conditions. Shelf life: 1 year from factory ship date (ZnCO3 carbonation particulate).	
No hazardous materials are formed during thermal decomposition.	
Hazardous Polymerization: Will not occur.	
Incompatibility or Material To Avoid: 1. Heated Magnesium. 2. Chlorinated Rubber Above 215C.	Decompose: Decomposes in bases & strong acids, neutralizing pH. Also will decompose in strong heated resins and polymers.

SECTION 11. TOXICOLOGICAL	
Acute toxicity - Oral:	LD 50 (rat, Lethal Dose (50%)): >15000 mg ZnO/kg (OECD 401)
Acute toxicity – Inhalation:	LC 50 (rat, 4 hours): > 5.7 mg ZnO (Klimisch et al. 1982).
Chronic toxicity:	NOAEL: 50 mg/ Zn/day (based on human clinical studies).
Carcinogenicity:	No evidence of carcinogenicity in laboratory animals or in man.
Mutation:	No evidence of genetic toxicity, in-vitro tests.
Reproduction toxicity:	No evidence of reproduction toxicity.
Acute toxicity – Dermal:	No data available.
Sensitization:	No sensitizing potential (guinea pig).
Skin irritation:	Not irritating (rabbit). OECD 404.
Eye irritation:	Not irritating (rabbit). OEDC 405.

SECTION 12. ECOLOGICAL	
Mobility:	Not applicable.
Persistence:	Not applicable.
Biological accumulation potential:	Not applicable.
Ecotoxicity:	EC 50 (Senastrum capricornutum, 72 hours): 170 mg ZnO. LISEC 1997.

SECTION 13. DISPOSAL CONSIDERATIONS	
Recycle: Material may be recyclable, contact U. S. Zinc. If disposed, follow regulations. Non AZO grades may require TCLP for RCRA metals for proper classification. Empty packaging is not USEPA waste regulated..	

SECTION 14. TRANSPORT INFORMATION	
Not DOT 172 or IMO Regulated.	NMFC Class 55.
NAFTA Tariff Class 2817.00.0000, Sched. B	

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SECTION 15. REGULATORY INFORMATION		
FDA: Listed as GRAS (Generally Recognized as Safe) at 21CFR182.8991. FDA approvals include Rubber 177.2600(c)(1), Food can linings: 175.300(b)(2), Food Color: 73.1991, 2991.		
SARA 302: RQ=None, TPQ=None. SARA 311/312: Yes (Acute). SARA 313: Zn & Pb Compounds.	RCRA 261: TCLP Determination (Pb, Cd). CERCLA 102/103: Name List, RQ=None. NSF 60/61: Submitted: NSF, UL. FCC: Listed.	
REACH = Yes. Pre-Registration numbers: 02-2114566664-38-0000 (USA origin), 05-2114620034-66-0000 (CN origin)	EU: This MSDS not valid within European Member states/countries.	
Prop. 65: Yes (Pb, Cd). CAA 112, 61 HAP: No. FIFRA 152 et seq.: No. CONEG: Compliant. ODS/ODC 82: No.	TSCA = Yes, on Inventory. Material is Compliant with TSCA. EINECS = Yes, on Inventory. DSL = Yes NDSL = No	ELINCS = No. AICS = Yes PICCS = Yes SWISS = YES ASIA-PAC = Yes

SECTION 16. OTHER INFORMATION																		
HMIS Hazard Rating: (Paint & Coating Industry)	<table border="1"> <tr> <td>Health</td> <td>1</td> </tr> <tr> <td>Flammability</td> <td>0</td> </tr> <tr> <td>Reactivity</td> <td>0</td> </tr> <tr> <td>Personal Protection</td> <td>E</td> </tr> </table>	Health	1	Flammability	0	Reactivity	0	Personal Protection	E	<table border="1"> <tr> <td colspan="2"><u>Rating Definitions</u></td> </tr> <tr> <td>0 = Minimal</td> <td>3 = Serious</td> </tr> <tr> <td>1 = Slight</td> <td>4 = Severe</td> </tr> <tr> <td>2 = Moderate</td> <td></td> </tr> </table>	<u>Rating Definitions</u>		0 = Minimal	3 = Serious	1 = Slight	4 = Severe	2 = Moderate	
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Personal Protective Index: E (recommended with bulk dust only) = Gloves + Mask + Goggles.																		
Label Precautions (Compliant with 29CFR1910.1200): Caution, may cause irritation to lungs, throat, nose, eyes or skin. Wear gloves, dust mask and safety glasses when handling dusty product in bulk.																		

DISCLAIMER	
The Material Safety Data listed on this sheet provides information on the hazards when working with this material, and is required by the Control of Substances Hazardous to Health (COSHH), and USOSHA Hazardous Communication (29CFR1919.1200). It does not cover risks associated with risks associated with specific actual uses of this material, which can only be carried out by the end-user.	
The data listed on this sheet is believed to be accurate, complete, and up to date by the preparer utilizing reasonably available published studies or other publications. We are not responsible for any inadvertent error or omission.	
End use of this product will include many factors beyond our control, and we cannot accept liability for any accident, injury or damage caused by its use.	
This MSDS is valid worldwide except in the European Union, and in other jurisdictions where local law is contrary to information herein.	