



SAFETY DATA SHEET

ZINC OXIDE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CAS NUMBER: 1314-13-2
PROPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (zinc oxide)
UN NUMBER: 3077

PRODUCT USE: As a pigment in white paints and enamels; printing inks, in cosmetics, quick setting cements; rubber mixes, white glue, porcelain glazes. In medicine as component of ointments (zinc cream), cosmetics, lotions, dusting powders, bandages. Zinc oxide is a bacteriostat not a bactericide. Manufacture of opaque glass and certain transparent glasses; electrostatic copying paper; as flame retardant; in electronics as semiconductor. Used in some animal food additives and fertilizers.

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Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

Hazardous Substance according to the criteria of the New Zealand Hazardous Substances and New Organisms legislation and GHS 7th Edition. Dangerous Good.

HAZARD LABELLING WARNING



HAZARD CLASSIFICATION AND STATEMENTS

HSNO **GHS**
9.1A Aquatic toxicity (Acute/Chronic) - Category 1

Very toxic to aquatic life with long lasting effects.

24 HOUR EMERGENCY CONTACT TELEPHONE 0800 CHEMCALL 0800 243 622

PRECAUTIONARY STATEMENTS**PREVENTION**

Avoid release to the environment.

RESPONSE

Collect Spillage.

DISPOSAL

Dispose of contents and packaging in accordance with relevant legislation.
See Section 13 of this SDS Document for more information.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%	HAZARDOUS
Zinc oxide	1314-13-2	>90	Yes

SYNONYMS: Flowers of Zinc; Zinc Monoxide; Zinc White; Global Supa Zinc.

Section 4 - FIRST AID MEASURES**SWALLOWED**

Immediately give a glass of water.

First aid is not generally required. If in doubt, contact a POISON CENTRE (0800 764 766) or a doctor.

EYE

Wash out immediately with fresh running water.

Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

If pain persists or recurs seek medical attention.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

Flush skin and hair with running water (and soap if available).

Seek medical attention in event of irritation.

INHALED

If dust is inhaled remove from contaminated area.

Other measures are usually unnecessary. If symptoms persist, call a doctor.

NOTES TO PHYSICIAN

Treat symptomatically based on individual reactions of patient and judgement of doctor.

NOTE: In an emergency dial 111, for advice contact a Poison Centre (0800 764 766).

Section 5 - FIRE FIGHTING MEASURES**EXTINGUISHING MEDIA**

In case of fire, use appropriate extinguishing media most suitable for surrounding fire conditions: water, water spray, dry powder, foam, carbon dioxide (CO₂).

FIRE FIGHTING

Alert Fire Brigade and tell them location and nature of hazard.

Clear fire area of all non-emergency personnel.

Stay upwind. Eliminate ignition sources.

Wear breathing apparatus plus protective gloves.

Prevent spillage from entering drains or water courses.
 Use firefighting procedures suitable for surrounding area.
 DO NOT approach containers suspected to be hot.
 Cool fire exposed containers with water spray from a protected location.
 If safe to do so, remove containers from path of fire.
 Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

Non-combustible solid.

HAZARDS FROM COMBUSTION PRODUCTS

Combustion products include zinc oxides.
 Irritating and toxic gases will be emitted in the event of a fire.

PERSONAL PROTECTIVE EQUIPMENT

Firefighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots and gloves). Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

Only fully trained personnel should be involved in handling chemicals.
 Personal Protective Equipment advice is contained in Section 8 of the SDS.

MINOR SPILLS

Environmental hazard - contain spillage.
 Clean up all spills immediately.
 Avoid contact with skin and eyes.
 Control personal contact by using protective equipment.
 Use dry clean up procedures and avoid generating dust.
 Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

Environmental hazard - contain spillage.
 Moderate hazard.
 Alert Emergency Services and tell them location and nature of hazard.
 Control personal contact by wearing protective clothing.
 Prevent, by any means available, spillage from entering drains or water courses.
 Recover product wherever possible.
 Use dry clean up procedures and avoid generating dust.
 Collect residues and place in sealed plastic bags or other containers for disposal.
 If contamination of drains or waterways occurs, advise Emergency Services.

PROTECTIVE ACTION CRITERIA (PAC) - Revision 29

Chemical (CAS Number)	PAC-1	PAC-2	PAC-3	Units
Zinc oxide (1314-13-2)	10	15	2500	mg/m ³

PAC-1: Mild, transient health effects.

PAC-2: Irreversible or other serious health effects that could impair the ability to take protective action.

PAC-3: Life-threatening health effects.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

Operators should be trained in procedures for safe use of this material.
 Avoid all personal contact, including inhalation.
 Wear protective clothing when risk of exposure occurs.
 Use in a well-ventilated area.

Avoid contact with incompatible materials.
 When handling, DO NOT eat, drink or smoke.
 Keep containers securely sealed when not in use.
 Avoid physical damage to containers.
 Always wash hands with soap and water after handling.
 Work clothes should be laundered separately. Launder contaminated clothing before re-use.
 Use good occupational work practice.
 Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE PACKAGING

Original packaging.
 Polyethylene or polypropylene container.
 Multi ply paper bag with sealed plastic liner or heavy gauge plastic bag.
 Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

Store away from chlorinated rubber, linseed oil, magnesium, hydrogen fluoride, aluminium hexachloro ethane, zinc chloride, phosphoric acid, water and oxidising agents.

STORAGE REQUIREMENTS

Store in original packaging.
 Keep containers securely sealed.
 Store in a cool, dry, well-ventilated area, out of direct sunlight.
 Store away from incompatible materials and foodstuffs.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	Measurement	Limit
New Zealand WES 2019	Zinc oxide (respirable dust)	time weighted average (TWA)	10 mg/m ³
New Zealand WES 2019	Zinc oxide (respirable fume)	time weighted average (TWA)	3 mg/m ³
New Zealand WES 2019	Zinc oxide (fume)	short term exposure limit (STEL)	10 mg/m ³

ENGINEERING CONTROLS

VENTILATION SYSTEM

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Refer to 'A simple guide to local exhaust ventilation' found on the WorkSafe New Zealand website.

PERSONAL RESPIRATORS

An approved P2 dust mask should be worn when using this product in dusty conditions or when exposure limits are exceeded. For more information see Australian/New Zealand Standard, AS/NZS 1715:2009 and AS/NZS 1716:2012. If in doubt, seek expert occupational hygiene advice.

EYE PROTECTION

Wear safety glasses with side shields or a full-face shield where splashing is possible. Refer to Personal eye protection Part 1: Eye and face protectors for occupational applications, Australian/New Zealand Standard: AS/NZS 1337.1:2010.

SKIN PROTECTION

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Refer to AS/NZS 2161.1:2016 Occupational Protective Gloves - Selection, use and maintenance. Dispose of contaminated gloves after use.

OTHER

Ensure there is ready access to an emergency shower.
Ensure that there is ready access to eye wash unit.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

White or yellowish white powder.

PHYSICAL PROPERTIES

Soluble in mineral acid, dilute acetic ammonia, and ammonia solution. Insoluble in alcohol.

PROPERTY	VALUE
State:	Solid
Odour:	Odourless
Molecular Weight:	81.37
Melting Range (°C):	~1975 (sublimes)
Boiling Range (°C):	Not available
Solubility in water (g/L, 29°C):	0.00016 (insoluble)
pH value:	~7
Density (g/cm ³):	~5.6
Volatile Component (%vol):	Not applicable
Relative Vapor Density (air=1):	Not applicable
Vapour Pressure (kPa):	Not applicable
Autoignition Temp (°C):	Not applicable
Flash Point (°C):	Not applicable
Lower Explosive Limit (%):	Not applicable
Upper Explosive Limit (%):	Not applicable
Decomposition Temp (°C):	Not available
Viscosity:	Not applicable
Evaporation Rate:	Not applicable

Section 10 - CHEMICAL STABILITY AND REACTIVITY

CHEMICAL STABILITY

Product is stable under normal conditions of use, storage and temperature.
Gradually absorbs CO₂ on exposure to air.

CONDITIONS TO AVOID

Avoid excessive heat, direct sunlight, static discharges, moisture, and temperature extremes.
Keep containers dry and tightly closed to avoid moisture absorption and contamination.

INCOMPATIBLE MATERIALS

Incompatible with chlorinated rubber, linseed oil, magnesium, hydrogen fluoride, aluminium hexachloro ethane, zinc chloride, phosphoric acid, water and oxidising agents.

HAZARDOUS DECOMPOSITION PRODUCTS

When heated to very high temperatures, zinc oxide sublimes to produce toxic fumes.

HAZARDOUS REACTIONS

Hazardous polymerization will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

ACUTE HEALTH EFFECTS

SWALLOWED

Moderately toxic to humans by ingestion. May cause gastro-intestinal irritation with abdominal pain, nausea, vomiting and diarrhoea.

EYE

Dust may cause mechanical irritation leading to redness and discomfort.

SKIN

Prolonged or repeated skin contact may cause irritation and/or dermatitis.

INHALED

May cause mechanical irritation of the respiratory tract. A few sources claim that finely divided zinc oxide dust can cause "metal fume fever." Zinc oxide dust is generally considered a nuisance dust; adverse effects are unlikely when exposures are kept under reasonable control. Inhalation of high concentrations of Zinc Oxide fume or dust may cause "Metal Fume Fever." Symptoms of metal fume fever may include a flu-like condition involving headache, chills, fever, sweats, nausea, vomiting, cough, muscle aches and pains, and difficulty breathing, pulmonary oedema. May also affect the liver. Symptoms may be delayed.

CHRONIC HEALTH EFFECTS

Chronic exposure to zinc oxide may cause respiratory tract irritation with nasopharyngitis and laryngitis.

TOXICITY AND IRRITATION DATA

TOXICITY

Acute Oral Toxicity, Rat, LD₅₀: >5000 mg/kg.

Oral Human LD_{Lo}: 500 mg/kg.

Acute Dermal Toxicity, LD₅₀: No data available.

Dermal, Rat LD_{Lo}: >2000 mg/kg.

Acute Inhalation Toxicity, LC₅₀: No data available.

Inhalation, Rat, 4h LD₅₀ >5700 mg/m³.

IRRITATION

Skin: Rabbit, Not irritating. [OECD 404]

Eyes: Rabbit, Not irritating. [OECD 405]

Carcinogenic effects: Not classified or listed by IARC, Ca Prop65, NTP or NIOSH.

Mutagenic effects: Not classified.

Reproductive or developmental effects: Not classified.

Aspiration hazard: No data available.

Specific target organ toxicity: Not classified.

Sensitisation (respiratory/contact): Not classified.

Section 12 - ECOLOGICAL INFORMATION

ECOTOXICITY

Very toxic to aquatic life with long lasting effects.

Harmful to terrestrial vertebrates.

TOXICITY DATA

Fish, (*Oncorhynchus mykiss*), LC₅₀: 1.1 mg/L [PAN Pesticides Database]

Crustacean, (*Daphnia magna*), 48h EC₅₀: 0.098 mg/L [NZ EPA CCID]

Algae, EC₅₀: 0.03 mg/L [NZ EPA CCID]

Bird, (*Colinus virginianus*): LD₅₀: 566 mg/kg [NZ EPA CCID]

Persistence and Degradability: Not readily degradable.

Mobility: Insoluble in water, sinks.

Bioaccumulation: No information available.

BOD and COD: No information available.

Products of Biodegradation: Not applicable.

Toxicity of the Products of Biodegradation: Not applicable.

DO NOT discharge into sewer or waterways.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal of Hazardous Substances is subject to the Resource Management Act and Council By-Laws in addition to HSNO requirements. Do not dispose with household rubbish.

PRODUCT

Recycle wherever possible. Special hazard may exist - specialist advice may be required.

Consult a Waste Management Company or authorized landfill for disposal options.

The product may be treated so that it is no longer hazardous by a means other than dilution. This includes incineration at an approved site, burial in a landfill or treatment at a sewage facility.

A class 9.1 substance that is or contains a component that is bioaccumulative and not rapidly degradable must be treated before discharge into the environment to reduce the percentage by volume of the substance in the discharge to 1% or any lesser percentage that may be set by the Authority after consideration of the ecotoxicity of the substance and the extent to which the substance is bioaccumulative.

PACKAGING

Recycle wherever possible. Special hazard may exist - specialist advice may be required.

Packaging should be rendered incapable of containing any material.

Puncture containers to prevent re-use and bury at an authorised landfill.

Empty containers may be decontaminated. The residual contents of the package must be diluted to below the thresholds for the respective hazard and the diluted residue is 1% or less of the volume of the package.

Alternatively, consult an approved Waste Management company for disposal options or dispose of at an approved waste disposal facility.

Observe all label safeguards until containers are cleaned and destroyed.

Where possible retain label warnings and SDS and observe all notices pertaining to the product.

Section 14 - TRANSPORT INFORMATION



UN Number:	3077
Proper Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.
Technical name:	zinc oxide
DG Class:	9
Subrisk:	n/a
Packing Group:	III
Label required:	MISCELLANEOUS, ENVIRONMENTALLY HAZARDOUS
Hazchem code:	ZZ
Marine Pollutant:	Yes
EMS Number:	F-A, S-F

Section 15 - REGULATORY INFORMATION

REGULATIONS

Classified as hazardous according to the criteria of the New Zealand Hazardous Substances and New Organisms Act.

This product has been assigned to the following Group Standard by Interchem Agencies Limited: Additives, Process Chemicals and Raw Materials (Subsidiary Hazard) Group Standard 2020.

EPA Approval number: HSR002503.

Certified handler, tracking and location compliance certification regulations do not apply.

For full HSNO controls and Health and Safety at Work regulations for this substance refer to the New Zealand EPA's Approved Hazardous Substances with Controls website.

Zinc Oxide (CAS 1314-13-2) is found on the following inventory lists:

NZIoC, AIIC, DSL, ENCS, EINECS, TSCA.

Section 16 - OTHER INFORMATION

NEW ZEALAND POISON CENTRE 0800 POISON (0800 764 766)

NZ EMERGENCY SERVICES: 111

Interpretation and Abbreviations

ACGIH - American Conference of Governmental Industrial Hygienists.

ACVM - Agricultural Chemicals and Veterinary Medicines.

AIIC - Australian Inventory of Industrial Chemicals.

AOX - Absorbable organic halogens.

APF - Assigned Protection Factor.

BOD - Biochemical Oxygen Demand.

China IECSC - Inventory of Existing Chemical Substances Produced or Imported in China.

COD - Chemical Oxygen Demand.

DSL - Canadian Domestic Substances List.

EINECS - European Inventory of Existing Commercial Chemical Substances.

ENCS - Japanese Existing and New Chemical substances.

GHS - Globally Harmonized System of Classification and Labelling of Chemicals.

IDLH - Immediately Dangerous to Life or Health Concentrations.

IARC - International Agency for Research on Cancer.

ISHL - Japanese Industrial Safety and Health Law List of Chemicals.

Koc - soil organic carbon-water partition coefficient

Kow - octanol/water partition coefficient

LOEL - Lowest Observed Effect Level.

LD₅₀ - Lethal Dose Low (the lowest dosage per unit of bodyweight of a substance known to have resulted in fatality in a particular animal species).

MAK - Maximum workplace concentration in the workplace air that generally does not have known adverse effects on the health of the employee nor cause unreasonable annoyance when a person is repeatedly exposed during long periods, usually 8 hours daily, 40hour working week).

NOAA - National Oceanic and Atmospheric Administration.

NOEC - No Observed Effect Concentration.

NTP - National Toxicology Program.

NZ EPA CCID - New Zealand Environmental Protection Authority Chemical Classification and Information Database.

NZIoC - New Zealand Inventory of Chemicals.

OECD HPV - The Organisation for Economic Co-operation and Development High Production Volume Chemicals.

PEL - Permissible exposure limit.

PPE - Personal Protective Equipment.

Prop 65 - California Proposition 65 List of Chemicals.

RTECS - Registry of Toxic Effects of Chemical substances.

SCAPA - Subcommittee on Consequence Assessment and Protective Actions.

STEL - Short term exposure limit.

TOC - Total Organic Carbon.

TSCA - US Toxic Substances Control Act Existing Chemicals.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

VOC - Volatile Organic Compounds.

Sources of key data used to compile the datasheet:

Manufacturer's SDS.

Inchem ICSC

CAMEO chemicals

NZ EPA CCID

SCAPA PAC database Rev 29.

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End of SDS