

Zinc Oxide

Safety data sheet in the 16-section GHS format · CAS 1314-13-2

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1. Identification of the substance and of the supplier

Product name	Zinc Oxide
Synonyms	zinc white, ZnO, zinc oxide powder, zinc oxide 99.5%
C.A.S. number	1314-13-2
Molecular formula	ZnO
Grade supplied	99.5% – 99.7%
Product group	Industrial Salts & Inorganics
Identified uses	Rubber & tyres, Ceramics & glass, Paints & coatings, Animal feed, Chemicals
Supplier	Velora Chemicals Private Limited
Emergency contact	Medical, fire or spill emergency — call the emergency services first: 112 (all-India), 101 fire, 108 ambulance. Velora Chemicals Private Limited does not at present operate a 24-hour chemical emergency advice line, and this sheet does not pretend otherwise. Every consignment despatched by road carries an emergency information panel under rule 134 of the Central Motor Vehicles Rules 1989 bearing a number from which expert advice on this material can be obtained, and the producer's safety data sheet issued with the consignment carries the producer's own 24-hour number where one is operated. For product, grade and documentation queries in business hours: +91 99255 22674.

2. Hazards identification

GHS signal word	Warning
Hazard classification	EU harmonised classification - CLP Annex VI, Index 030-013-00-7: Aquatic Acute 1 - H400; Aquatic Chronic 1 - H410. Signal word Warning. There is NO harmonised health-hazard classification for zinc oxide, so no H3xx statements apply to the powder as supplied. Separately from classification, ILO ICSC 0208 flags that inhalation can produce fever - metal fume fever from freshly generated zinc oxide fume is a recognised occupational effect that is not captured by any GHS classification, and it should be covered in the SDS narrative rather than on the label.

3. Composition / information on ingredients

Substance	Zinc Oxide
C.A.S. number	1314-13-2
Molecular weight	81.4 (ILO ICSC 0208)
Composition	99.5% – 99.7%

4. First-aid measures

Eye contact	Rinse with plenty of running water for several minutes, holding the eyelids apart; remove contact lenses if easily possible and continue rinsing. Refer for medical attention if irritation persists - the effect of the powder is mainly mechanical abrasion.
Skin contact	Rinse the skin with water, then wash with water and soap. Refer for medical attention if irritation develops. Zinc oxide itself is used therapeutically on skin, so a single contact needs no more than washing.
Inhalation	Move the casualty to fresh air and keep them at rest. Refer for medical attention if breathing difficulties AND/OR FEVER develop. Inhaling freshly generated zinc oxide fume - from welding, cutting, brazing or casting on galvanised or zinc-bearing metal, or from overheating the powder - can cause metal fume fever, in which fever, chills, muscle ache, dry cough and a metallic taste appear typically 4-12 hours after exposure and usually settle within 24-48 hours. Because onset is delayed, a worker who felt well at the end of the shift can present unwell that night; tell the casualty to seek medical advice if this happens and to report the exposure.
Ingestion	Rinse the mouth. Give water to drink. Refer for medical attention if the casualty feels unwell. Zinc oxide is poorly absorbed from the gut and small ingestions are of low concern.

5. Fire-fighting measures

Flash point	Not flammable
Suitable extinguishing media	Water fog, foam, dry chemical powder or carbon dioxide, chosen to suit the surrounding fire. The substance itself does not contribute fuel.
Unsuitable extinguishing media	Do not use a high-pressure water jet: it will spread the material and the fire.
Special hazards arising from the substance	Hazardous gases and decomposition products may be formed in a fire, from this substance or from its packaging and the materials stored with it. Packaging and pallets are themselves a substantial fire load. That is true even though the contents do not contribute fuel.
Advice for fire-fighters	Fire-fighters must wear self-contained breathing apparatus and full protective clothing. Keep unnecessary personnel away and upwind. Prevent firefighting run-off from entering drains, surface water or groundwater.

6. Accidental release measures

Keep unnecessary personnel away and upwind, and ventilate. Wear the protective equipment in section 8, including respiratory protection, before approaching. Eliminate ignition sources and prohibit smoking before approaching. Avoid raising dust, and never blow a spilled powder down with compressed air. Dry-collect — vacuum with a HEPA-filtered unit, or sweep gently without raising dust — into labelled, closable containers for disposal under section 13. A spill inside a vessel, tank, silo, container or pit is a confined-space job: test the atmosphere and work under permit. A fine powder makes a floor slippery, especially once wet, so treat every wetted surface as slippery until it has been washed and dried. Prevent entry to drains, surface water and groundwater. Do not return spilled material to the original container; a damaged bag should be overpacked into a labelled outer rather than decanted into an unmarked one.

7. Handling and storage

- Keep bags dry and closed. Zinc oxide is not hygroscopic, but it picks up moisture and carbon dioxide slowly in an open bag and can cake.
- The dust is the main hazard in a compounding room: it irritates the nose and throat, and NIOSH sets a 5 mg/m³ eight-hour limit on zinc oxide dust. Use dust extraction and a mask when charging mixers, and avoid dry sweeping. Metal fume fever is a separate risk that comes from freshly formed zinc oxide fume — welding, galvanising, molten zinc — rather than from handling the powder.
- Very toxic to aquatic life with long-lasting effects — keep washings and spillage out of drains and watercourses. Unlike most of our dry inorganics, zinc oxide is a dangerous good for transport: it consigns as UN 3077, environmentally hazardous substance, solid, n.o.s. (zinc oxide), Class 9, packing group III, and is a marine pollutant under IMDG. Export shipments need

the DG declaration and marks; we confirm the consignment details with your forwarder before booking.

Storage: Store in closed bags, big-bags or containers in a dry place at room temperature (about 15-25 C), separated from acids, strong alkalis, aluminium and magnesium powders and chlorinated rubber. Control dust during tipping, conveying and blending - use local exhaust ventilation and keep surfaces clear of settled powder. Provide bunding and containment so that spillage and any firefighting run-off cannot reach drains, surface water or groundwater, which is the operative control for an H410 substance. Protect bags from moisture, which causes caking.

8. Exposure controls / personal protection

Engineering controls. Enclose every transfer, tipping, bag-slitting and sampling point and fit local exhaust extraction at each, and keep airborne concentrations below the limit in force at the place of use. Provide an eyewash within reach of the working position, and a safety shower wherever the material is classified corrosive or irritant or is handled in quantity. Do not eat, drink or smoke in the handling area; wash before breaks. Where no limit is stated above, occupational exposure limits vary by jurisdiction: check the limit in force at the place of use and the producer's sheet for the grade supplied, and record which value your assessment adopted. Select eye, skin and respiratory protection on the strength of a measured or modelled exposure assessment, not on this sheet alone.

9. Physical and chemical properties

Appearance	White to off-white, odourless fine powder. It reversibly develops a faint yellow tinge when hot and returns to white on cooling.
Physical state	Solid (fine powder)
Melting / freezing point	1975
Boiling point	Not available - zinc oxide sublimates and decomposes rather than boiling at atmospheric pressure; no boiling point is reported by ILO ICSC 0208 or by the producer sheets consulted.
Relative density	5.68 g/cm ³ at 20 C (ILO ICSC 0208 gives 5.6 g/cm ³). Bulk density 300-500 kg/m ³ - much lower than the true density, and it varies widely between direct-process and indirect-process grades, so use the producer's figure for packaging and silo design.
Solubility in water	Practically insoluble - 0.002 g/L at 20 C (ILO ICSC 0208 states 'none'). Zinc oxide is amphoteric and dissolves readily in dilute acids and in strong alkalis.
pH	7-8 in a 50 g/L aqueous suspension at 20 C (producer data). Because the solid is practically insoluble this is a suspension pH, not a solution pH - always state the concentration and that it is a slurry.
Flash point	Not flammable
Auto-ignition / ignition temperature	Not available
Explosive / dust-explosion properties	Not available
Vapour pressure	Not available
Vapour density	Not available
Partition coefficient (log Pow)	Not available
Particle characteristics	Not available
Molecular weight	81.4 (ILO ICSC 0208)

10. Stability and reactivity

Incompatible materials Aluminium powder, magnesium powder and chlorinated rubber - reacts violently on heating, with fire and explosion risk (ILO ICSC 0208). Acids and strong alkalis - zinc oxide is amphoteric and dissolves in both, with heat evolved. Strong oxidising agents. Avoid contact with chlorinated solvents and rubber compounding accelerators at elevated temperature without process controls.

Conditions to avoid Store in closed bags, big-bags or containers in a dry place at room temperature (about 15-25 C), separated from acids, strong alkalis, aluminium and magnesium powders and chlorinated rubber. Control dust during tipping, conveying and blending - use local exhaust ventilation and keep surfaces clear of settled powder. Provide bunding and containment so that spillage and any firefighting run-off cannot reach drains, surface water or groundwater, which is the operative control for an H410 substance. Protect bags from moisture, which causes caking.

11. Toxicological information

The health hazards classified for this substance are listed in section 2, and the corresponding first-aid measures in section 4. Numerical toxicological endpoints are not reproduced here: refer to the producer's safety data sheet for the grade supplied, and to the ECHA and PubChem entries for the substance.

12. Ecological information

Where section 2 or section 14 classifies this substance as hazardous to the aquatic environment, prevent any release to drains, surface water or groundwater and treat aqueous effluent before discharge. Otherwise, refer to the producer's sheet.

13. Disposal considerations

Dispose of the substance and its container through an authorised facility under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 where the waste is scheduled under those Rules, and otherwise as non-hazardous industrial waste, in each case under the conditions of the State Pollution Control Board consent in force at the site. Whether a particular waste stream is scheduled depends on the substance and on what it has been mixed with, so classify the waste before consigning it. Do not reuse empty containers for any other purpose.

14. Transport information

UN number	UN 3077
Class	9 (miscellaneous dangerous substances and articles), classification code M7
Packing group	III
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC OXIDE) - marine pollutant. The technical name in brackets is mandatory under special provision 274.

15. Regulatory information

Supply in India is subject to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 where the substance is scheduled, and to any product-specific licensing named on the product page. Classification and labelling follow the GHS as adopted in the jurisdiction of use.

Note: YES - this product carries an environmentally hazardous transport entry, and this is the single most commonly missed item on zinc oxide paperwork. The harmonised classification Aquatic Acute 1 / Aquatic Chronic 1 (H400/H410) makes it a Class 9 dangerous good, UN 3077, PG III, and a marine pollutant, confirmed by both ILO ICSC 0208 and producer SDSs. Sheets that say 'not a dangerous good' are only correct below the small-quantity threshold: under ADR/RID special provision 375, IMDG (2.10.2.7 / SP 375) and IATA special provision A197, UN 3077 in PG III is exempt when packed in single or inner packagings of not more than 5 kg net each, whatever the total consignment size - and where the exemption is used the packages must NOT be marked, labelled or declared as dangerous goods. A 25 kg bag or a big-bag is above the threshold and must be consigned as UN 3077. Note also the striking gap between true density (5.68 g/cm³) and bulk density (300-500 kg/m³): a quoted 'density' for zinc oxide is ambiguous unless you say which. On grades, 99.5-99.7% ZnO spans both the indirect (French process) and direct (American process) routes; the assay figure alone does not tell a buyer the surface area, particle size or lead/cadmium content, which is what usually governs fitness for rubber, ceramic, pharmaceutical or feed use. Finally, the 99.5% and 99.7% grades are chemically identical in hazard terms - the classification does not change with purity within this range.

16. Other information

Version	1.0
Date of issue	07 October 2026
Supersedes	No previous version
Regulatory basis as at the date of issue	EU CLP Regulation 1272/2008 as amended, including Annex VI harmonised classifications; UN Model Regulations and the IMDG Code Amendment 42-24, mandatory from 1 January 2026; ADR 2025; and, in India, the Manufacture, Storage and Import of Hazardous Chemical Rules 1989 and the Central Motor Vehicles Rules 1989.

How this sheet was compiled and what governs. This sheet was prepared by Velora Chemicals Private Limited as the supplier, from PubChem, the ECHA CLP inventory including Annex VI harmonised classifications, ILO International Chemical Safety Cards and published producer safety data sheets. Values that could not be confirmed from those sources are shown as "Not available" rather than estimated. **The producer's safety data sheet for the specific grade and lot supplied is the governing document** and is issued with the consignment; where the two differ, the producer's sheet prevails. This sheet carries no warranty of the properties of any particular batch. Velora Chemicals Private Limited is a bulk supplier and trader, not a manufacturer.

Sources consulted: https://chemicalsafety.ilo.org/dyn/icsc/showcard.display?p_card_id=0208;
https://www.caelo.de/getfile.html?type=sdb_en&num=2736&cntry=en; <https://adr-tool.com/2265/un-3077>