Nano Zinc Oxide Powder (ZnO) — Product Code ZN-010

Product name	Nano Zinc Oxide Powder (ZnO)
Product code	ZN-010
CAS No.	1314-13-2
EC No.	215-222-5
Revision	1.0
Issue date	19 August 2026
Intended markets	Iran and neighboring/regional markets

Important: This document is a product-specific draft SDS prepared from the manufacturer's supplied specifications and publicly available chemical safety information. It should be reviewed and approved by a qualified EHS/regulatory professional before being used as the final legally controlled SDS for commercial distribution or for a specific jurisdiction.

1. Identification

Product identifier	Nano Zinc Oxide Powder (ZnO)
Product code	ZN-010
CAS number	1314-13-2
EC number	215-222-5
Recommended use	Raw material for cosmetics-related formulations, UV-protection applications, electronics, and polymer additive applications; research and industrial use.
Restrictions on use	Avoid uses involving uncontrolled airborne nanopowder exposure. Do not use in applications for which the product has not been evaluated or legally authorized.
Manufacturer / supplier	Nanomavad Sazan Zagros Co. (NanoMAT)
Address	Unit 204, Technology Growth Center, Abadeh County, Fars Province, Iran
Telephone / WhatsApp	+98 936 687 8867
Email	info@nanomat.ir
Website	nanomat.ir
Emergency telephone	Not separately designated. Contact the supplier at +98 936 687 8867 for product-related emergencies.

2. Hazard identification

GHS classification (general substance information):

Hazard class	Category	Hazard statement
Hazardous to the aquatic environment — acute	1	H400 — Very toxic to aquatic life.
Hazardous to the aquatic environment — chronic	1	H410 — Very toxic to aquatic life with long lasting effects.

Signal word: Warning

Precautionary statements: P261 Avoid breathing dust. P273 Avoid release to the environment. P280 Wear protective gloves/eye protection and appropriate respiratory protection where dust exposure may occur. P391 Collect spillage. P501 Dispose of contents/container in accordance with applicable local regulations.

Other hazards: The product is a dry nanopowder and may generate airborne particulate matter during handling. Avoid creating and inhaling dust. Prolonged or high-level inhalation of zinc oxide dust/fume can cause adverse respiratory effects; suitable engineering controls and respiratory protection should be used where exposure cannot be adequately controlled.

Note on nanoform: The hazard profile of a specific nanoform may differ from bulk zinc oxide. This SDS therefore emphasizes dust control and safe handling of the supplied dry nanopowder.

3. Composition / information on ingredients

Component	CAS No.	Concentration
Zinc oxide (ZnO), nanopowder	1314-13-2	≥99.99% (manufacturer specification)
Lead (Pb)	7439-92-1	<1 ppm
Iron (Fe)	7439-89-6	<5 ppm
Cadmium (Cd)	7440-43-9	<0.1 ppm

4. First-aid measures

Inhalation	Move the person to fresh air. Keep at rest. If coughing, breathing difficulty, fever-like symptoms, or other symptoms occur, seek medical attention. Obtain medical advice if symptoms persist.
Skin contact	Wash with plenty of water. Remove contaminated clothing. Seek medical advice if irritation develops or persists.
Eye contact	Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek medical advice if irritation persists.

Ingestion	Rinse mouth. Do not induce vomiting unless directed by medical personnel. Seek medical advice if unwell.
Most important symptoms	Dust exposure may cause respiratory irritation. High or prolonged exposure to zinc oxide dust/fume may cause flu-like symptoms including fever, chills, cough, headache, nausea, and muscle aches.

5. Fire-fighting measures

Suitable extinguishing media: Use extinguishing media appropriate for the surrounding fire.

Specific hazards: Zinc oxide is not expected to be readily combustible. Heating may produce zinc oxide fumes. Avoid generating or dispersing dust.

Protective equipment: Firefighters should use standard protective equipment and, where smoke/fume exposure is possible, positive-pressure self-contained breathing apparatus.

6. Accidental release measures

Personal precautions: Avoid breathing dust. Restrict access to the affected area. Use appropriate respiratory protection and protective clothing. Avoid dry sweeping that may disperse nanopowder into the air.

Environmental precautions: Prevent release to drains, surface water, groundwater, and soil. Zinc oxide is hazardous to aquatic life.

Methods for containment and cleanup: Collect using a method that minimizes airborne dust, preferably a suitable HEPA-filtered vacuum or damp collection method where compatible. Place material in a closed, labelled container for appropriate disposal. Do not use compressed air for cleanup.

7. Handling and storage

Handling: Handle in a well-ventilated area or under local exhaust ventilation. Minimize dust generation. Avoid inhalation and contact with eyes. Keep containers closed when not in use. Wash hands after handling.

Storage: Store tightly closed in a cool, dry, well-ventilated place. Protect from moisture and contamination. Keep away from incompatible materials and food/feed where not specifically authorized for such use.

8. Exposure controls / personal protection

No product-specific occupational exposure limit has been established here for the supplied nanoform. Applicable national occupational exposure limits for zinc oxide should be checked before workplace use.

Engineering controls	Local exhaust ventilation and dust-control measures at points of generation. Use closed handling systems where practicable.
Respiratory protection	Where airborne dust cannot be adequately controlled, use an appropriate particulate respirator selected according to the applicable occupational hygiene program and local regulations.
Eye protection	Safety glasses with side protection; use sealed goggles where significant dust exposure is possible.
Skin protection	Protective gloves and suitable work clothing.
Hygiene	Do not eat, drink, or smoke while handling. Wash hands and exposed skin after work.

9. Physical and chemical properties

Appearance	Milky white powder
Odour	Odourless
Chemical formula	ZnO
Molecular weight	81.38 g/mol
Particle size	15–40 nm (manufacturer specification)
Morphology	Spherical (manufacturer specification)
Crystal structure	Hexagonal wurtzite
Purity	≥99.99%
BET surface area	30–40 m²/g

pH	6.5–7.5 (10% aqueous dispersion)
Loss on drying	<0.5% (manufacturer specification)
Relative / crystal density	~5.61 g/cm³ (theoretical/crystal density; not bulk density)
Melting point	~1975 °C
Boiling point	~2360 °C
Water solubility	Slightly soluble / very low solubility; values depend on test conditions and particle form.

10. Stability and reactivity

Reactivity: No hazardous reactivity expected under normal conditions of use.

Chemical stability: Stable under recommended storage conditions.

Conditions to avoid: Excessive heating, uncontrolled dust generation, moisture contamination, and conditions that promote dispersion of nanopowder.

Incompatible materials: Strong acids and strong bases may react with zinc oxide. Specific incompatibilities should be assessed for the intended formulation.

Hazardous decomposition products: Zinc-containing fumes may be produced at high temperatures.

11. Toxicological information

The product is a zinc oxide nanopowder. Toxicological information for bulk zinc oxide cannot necessarily be assumed to represent every nanoform. Occupational exposure should therefore be minimized, especially by inhalation.

Likely routes of exposure	Inhalation of airborne dust; eye/skin contact; accidental ingestion.
Acute effects	Dust may irritate the respiratory tract and eyes. High exposure to zinc oxide fumes/dust may produce flu-like symptoms.
Skin corrosion/irritation	No classification assigned here based solely on available substance information.
Serious eye damage/irritation	Dust may cause mechanical irritation.
Sensitisation / mutagenicity / carcinogenicity / reproductive toxicity	No product-specific classification assigned here. A formal regulatory assessment should be performed for the specific nanoform and intended market before final commercial release.

12. Ecological information

Zinc oxide is hazardous to aquatic organisms. Avoid environmental release. Zinc is an essential element but elevated concentrations can be harmful to aquatic organisms.

Aquatic toxicity	Very toxic to aquatic life; long-lasting effects may occur.
Persistence / degradability	Not applicable in the conventional sense to an inorganic compound.
Bioaccumulative potential	No product-specific assessment provided in this SDS.
Mobility in soil	Behaviour depends on pH, dissolved organic matter, and environmental conditions.

13. Disposal considerations

Dispose of material and contaminated packaging in accordance with applicable local, regional, and national regulations. Prevent release to drains and the environment. Do not dispose of large quantities with ordinary household waste. Empty containers should be handled as potentially contaminated until appropriately cleaned or disposed of.

14. Transport information

Transport classification can depend on the mode of transport, quantity, packaging, and jurisdiction. This draft SDS does not assign a final UN transport classification without shipment-specific regulatory review.

ADR/RID	Not assigned in this draft; verify for the intended shipment.

IMDG	Not assigned in this draft; verify environmental transport requirements.
IATA	Not assigned in this draft; verify before air shipment.

15. Regulatory information

This product is intended primarily for Iran and neighboring/regional markets. Applicable Iranian chemical, occupational health, waste, transport, cosmetics, food, and product-specific regulations must be assessed before placing the product on a particular market.

For reference, zinc oxide has EC No. 215-222-5 and CAS No. 1314-13-2. Regulatory status and permitted uses can differ by jurisdiction and by product application. In particular, cosmetic and food uses may require additional purity, microbiological, toxicological, contaminant, and application-specific documentation beyond an SDS.

16. Other information

Abbreviations: SDS — Safety Data Sheet; GHS — Globally Harmonized System; BET — Brunauer–Emmett–Teller surface area; PPE — Personal Protective Equipment; TDS — Technical Data Sheet; COA — Certificate of Analysis.

Data sources used for general chemical safety information: PubChem Zinc Oxide record; ECHA information on zinc oxide and regulatory classification resources; ILO/WHO International Chemical Safety Card information where applicable. These sources describe zinc oxide generally and do not replace product-specific testing.

Manufacturer-supplied product specifications used in this document: ZnO purity ≥99.99%; particle size 15–40 nm; BET 30–40 m^2/g; spherical morphology; hexagonal wurtzite structure; milky white appearance; pH 6.5–7.5 at 10% aqueous dispersion; loss on drying <0.5%; Pb <1 ppm; Fe <5 ppm; Cd <0.1 ppm.

Revision note: Version 1.0 — initial product-specific SDS draft prepared 19 August 2026.