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SAFETY DATA SHEET
ZINC OXIDE

This SDS is valid for use in the European Union member countries and the UK only.
This SDS complies with regulation (EU) 2020/878.

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This SDS complies with regulation (EU) 2020/878.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 **Product identifier**
Product Name: Zinc Oxide
Synonyms: zinc oxide – standard, oxozinc (IUPAC name), ZINKOXID, OXYDE DE ZINC, OSSIDO DI ZINCO, ZINKOXIDE, OXIDO DEL CINC, TLENED CYNKU
CAS number: 1314-13-2 EC number: 215-222-5 EU Annex I index number 030-013-00-7
Molecular formula: OZn Molecular weight range 81.4084
This substance is not nano. This SDS covers all grades of Zochem zinc oxide
The substance, zinc oxide, is a mono constituent substance (origin: inorganic)

1.2 **Relevant identified uses of the substance or mixture and uses advised against**: None

1.3 **Details of the supplier of the safety data sheet**
EU OR: Reach Only Representative (Ireland) Ltd., Swinford Ireland. Email: alerts@RORltd.com Website www.rorltd.com. Tel: +44 (0) 1565 748111.
UK REACH OR: Reach Only Representative, Booths Park 1, Chelford Road, Knutsford, Cheshire, WA16 8GS, UK. Website www.rorltd.com. Tel: +44 (0) 1565 748111.
For additional information contact Zochem. Website: www.zochem.com, 600 Printwood Drive, Dickson, TN 37055-3010 U.S.A., Phone: +1 615 446-8791

1.4 **Emergency telephone number**: +44(0) 1565 748111, +(1)901-833-2118, +(1)647-237-7222

SECTION 2: Hazards identification

2.1 **Classification of the substance or mixture**
Name: zinc oxide standard (typical grade with low level impurities, hexagonal crystalline structure).
Degree of purity: >99.0 % (w/w). All metal impurities <0.1%.
Classification according to Regulation (EC) No 1272/2008 (CLP/GHS) as amended by 2016/1179:
Aquatic Acute 1: H400 Very toxic to aquatic life, M factor 1
Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects, M factor 1

2.2 **Label elements** (according (EC) No 1272/2008 (CLP/GHS) in EEA member countries & the UK)
Hazard: H410: Very toxic to aquatic life with long lasting effects.

Signal word: Warning. Hazard pictogram: GHS09 environment

Precautionary: P273: Avoid release to the environment. P391: Collect spillage.
P501: Dispose of contents/container as hazardous or special waste in accordance with local law.

Classification and labelling according to CLP / GHS for physicochemical properties:
Not classified for physicochemical properties

Classification and labelling according to CLP / GHS for health hazards:
Not classified for health hazards

Note, "Preparations" containing >25% or greater zinc oxide will also be classified as "Environmentally Hazardous Substance." Preparations containing <= 25% zinc oxide (and if the preparation or mixture contains no other classified component), the preparation or mixture is not EU CLP or GHS regulated.

2.3 **Other hazards**: None.

SECTION 3: Composition/information on ingredients

3.1 **Substances:**

Constituent	Typical Concentration	Concentration range	Remarks
zinc oxide*	ca. 99.9% (w/w)	>99.0% -- <100.0%	hexagonal crystalline structure

(* EC no. 215-222-5, CAS no. 1314-13-2, Index no. 030-013-00-7)

State/form of the substance: powder

Additional information on impurities:
Contains naturally occurring inorganic impurities less than SDS reporting de minimis.
Product may contain processing aid at customer request.
After manufacturing, product absorbs minimal moisture from humidity in air during handling and storage.

3.2 **Mixtures**: not applicable

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**
Bad cough or headache. Move person to fresh air. No special treatment known.
Excess dust must naturally purge or absorb.

SECTION 5: Firefighting measures

5.1 **Extinguishing media**

None. Zinc oxide will not burn.
Use extinguishing media appropriate for the surrounding fire.

5.2 **Special hazards arising from the substance or mixture**

None. Hazardous decomposition product(s): None.

5.3 **Advice for firefighters**

Avoid release of fire control water containing zinc oxide to the environment.
In the UK, upon direct exposure, contact/call 111 at The National Poisons Information Center, (24h service). Hazchem Code: 2Z.

SECTION 6: Accidental release measures

6.1 **Personal precautions, protective equipment and emergency procedures**

In excessive dust conditions, wear protective clothing, dust respirator, and goggles.

6.2 **Environmental precautions**

Avoid release to the environment.

6.3 **Methods and material for containment and cleaning up**

Small or large spills, shovel up spills into appropriate labeled container.
Recover the product by vacuum.
If sweeping unavoidable, use soft bristles to reduce creation of airborne dust.
Dry spills, not mixed with other chemicals, may be recyclable. Contact Zochem.

6.4 **Reference to other sections**: none

SECTION 7: Handling and storage

7.1 **Precautions for safe handling**

In excessive dust conditions, wear protective clothing, dust respirator, and goggles.

7.2 **Conditions for safe storage, including any incompatibilities**

Keep dry. Germany TRGS 510 Annex 4, Class 13 Non-combustible solids that cannot be assigned to other storage class**.**

7.3 **Specific end use(s)**: not applicable (no specific end use)

SECTION 8: Exposure controls/personal protection

8.1 **Control parameters and exposure limits**

Country/organization	8 hour-TWA	15 min-STEL mg/m^3
Germany (MAK)	5 mg/m^3 (fume) 6 mg/m^3 (dust)	Inhalable dust = 10 mg/m^3 Respirable dust = 3 mg/m^3
France (INRS)	5 mg/m^3 (fume) 10 mg/m^3 (dust)	
UK (OEL)	5 mg/m^3 (fumes) 10 mg/m^3 (dust)	TWA – 8 hour: 5 mg/m3 (nuisance dust) STEL – 15 minutes: 10 mg/m3 (nuisance dust)
The Netherlands	5 mg/m^3 (fumes)	
Sweden	5 mg/m^3 (fumes)	
Denmark	4 mg/m^3 (fumes) 10 mg/m^3 (dust)	
USA (Zinc Oxide)	5 mg/m^3 (fumes)	

	15 mg/m^3 (dust; total) 5 mg/m^3 (dust; respirable)	

DNELS

	Workers				General population			
Route of exposure	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
Oral	Not required					No hazard identified	Not required	No hazard identified
Inhalation	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified
Dermal	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified

PNECS relative to zinc ion

Environmental protection target	PNECs
Freshwater	14.4 µg/L
Freshwater sediments	146.9 mg/kg sediment dw
Marine water	7.2 µg/L
Marine sediments	162.2 mg/kg sediment dw
Food chain	No potential for bioaccumulation
Microorganisms in sewage treatment	100 µg/L
Soil (agricultural)	83.1 mg/kg soil dw
Air	No hazard identified

PNECS relative to Zinc Oxide

Environmental protection target	PNECs
Freshwater	17.9 µg/L
Freshwater sediments	182.8 mg/kg sediment dw
Marine water	9 µg/L
Marine sediments	201.9 mg/kg sediment dw
Food chain	No potential for bioaccumulation
Microorganisms in sewage treatment	124.5 µg/L
Soil (agricultural)	103.4 mg/kg soil dw
Air	No hazard identified

8.2 Exposure controls/Personal protection:

Route(s) Of Entry: 1. Inhalation. 2. Dermal. 3. Eyes. 4. Digestion.
Eye protection: Recommend safety glasses in bulk excess dusk conditions.
Protection for skin: Recommend long sleeves in bulk excess dust conditions.
Protection for hands: Recommend gloves to reduce drying of skin
Respiratory protection: Recommend dust filter mask in bulk dust conditions.
(Must wear respirator of proper type if exposure above 8 hour TWA)

8.2.1 Appropriate engineering controls:

Technical conditions and measures at process level (source) to prevent release:
Process enclosures closed circuits or semi-enclosures where appropriate.
Local exhaust ventilation with potential dust and fumes generation.
Containment of liquid volumes in sumps to collect/prevent accidental spillage.

Technical conditions and measures to control dispersion from source towards the worker:
Cyclones/filters to minimize dust emissions.
Good general housekeeping and maintenance practices.

Organizational measures to prevent /limit releases, dispersion and exposure:
Safety Management system for good work, training, cleaning, PPE and hygiene practices.

8.2.3. Environmental exposure control

Technical conditions and measures at process level (source) to prevent release:
Process enclosures and closed circuits where relevant and possible.
Local exhaust ventilation with potential dust generation, dust capturing and removal techniques
Containment of liquid volumes in sumps to collect/prevent accidental spillage.

Technical onsite conditions and measures to reduce discharges, air emissions and releases to soil:
On-site waste water treatment techniques.
Containment of liquid volumes in sumps to collect/prevent accidental spillage
Air emissions are controlled by use of bag-house filters or other air emission abatement devices.

Organizational measures to prevent/limit release from site:
Management system (i.e. ISO9001 or ISO45001) for good work, training, cleaning, PPE and hygiene practices.
SEVESO III compliance (Directive 2021/18/EU), if applicable

SECTION 9: Physical and chemical properties

9.1 **Information on basic physical and chemical properties** (N/A = not applicable)

A. Physical state:	Solid, powder or granular
B. Color:	White, off white, cream, grayish, or yellowish
C. Odor:	Odorless
D. Melting point/freezing point:	Will not melt. Will not freeze. Malleable > 300°C/572°F Sublimation 1975°C. No observable exothermic, endothermic, oxidation, or decomposition.
E. Boiling point:	N/A (substance decomposes before boiling)
F. Flammability:	Not flammable. Will not burn
G. Lower and upper explosion limit:	N/A (does not apply to solids)
H. Flash point:	N/A (does not apply to inorganic solids)
I. Auto-ignition temperature:	The substance is not auto-ignitable or explosive
J. Decomposition temperature:	N/A
K. pH:	Neutral, 6.8 to 8 (7.37 nominal), in DiH2O
L. Kinematic viscosity:	N/A (does not apply to solids)
M. Solubility:	Negligible (solubility of Zn in ZnO is 2.9 mg/l in water)
N. Partition coefficient n-octanol/water:	N/A (does not apply to inorganic substances)
O. Vapor pressure:	N/A (melting point above 300°C)
P. Density:	5.68 g/cm3
Q. Relative vapor density:	N/A (does not apply to solids)
R. Particle characteristics:	typical D50 <10 um, D80 <20 um, by laser diffraction

S. Surface area: 2-9 m^2/g typical

T. Nano: This product is not nano (over 50% of substance particles by number are over 100 nm size).

SECTION 10: Stability and reactivity

10.1 **Reactivity**: Stable under normal dry air conditions
10.2 **Chemical stability**: Product is stable
10.3 **Possibility of hazardous reactions**: None
10.4 **Conditions to avoid**: Keep from getting wet, moisture will damage substance*
10.5 **Incompatible materials**: Heated magnesium. Chlorinated rubber above 215C
10.6 **Hazardous decomposition products**: None
10.7 Decomposition: Product decomposes in acids and bases
10.8 Degradation/shelf life: Slow degrade to zinc carbonate (not hazardous)*

*ZnO testing expiration is 12 months from date of manufacturing (DOM) for >= 8.0 m2/g surface area, rubber applications, and product stored under roof only. Testing expiration is 18 months from DOM for <8 m2/g in other applications and stored inside a building. Product should be consumed within one month after bag opening. Bags stored in >65% RH (relative humidity) should be used within six months. Processes sensitive to clumping should use within 6 months or pre-screen product before use. ZnO slowly degrades to zinc carbonate ($ZnCO^3$) by reacting with CO^2 in ambient air accelerated by moisture or higher m^2/g surface area. Degraded product may have hard particulates.

SECTION 11: Toxicological information

11.1 **Information on hazard classes as defined in Regulation (EC) No 1272/2008**

a) Acute Toxicity – classification criteria not met: Not acute toxic

Values provided for ZnO	**Effect dose/ concentration**	**Species**	**Method**
Acute oral toxicity	LD50 >2000 mg/kg bw	Rat	OECD 401 & OECD 423
Acute inhalation toxicity	LC50 >5.7 mg/L	Rat	OECD 403
Acute dermal toxicity	LD50 >2000 mg/kg bw	Rat	OECD 402

b) Skin corrosion / irritation - classification criteria not met: Not skin irritant

c) Serious eye damage/irritation - classification criteria not met: Not eye irritant

Species	Method	Result
New Zealand white rabbits	OECD 405	Not irritant

d) Respiratory or skin Sensitization - classification criteria not met: Not sensitizing

Species	Method	Result
Guinea pigs	OECD 406	Not sensitizing

e) Germ cell mutagenicity – classification criteria not met: Not germ cell mutagen.
Based on the weight of the evidence from the existing in vitro and in vivo genotoxicity assays available, it is concluded that the zinc category substances do not have biologically relevant genotoxic activity. Consequently, no classification for germ cell mutagenicity is applicable.
This conclusion is in line with those achieved by other regulatory reviews of the genotoxicity of zinc compounds (WHO, 2001; SCF, 2003; EU RAR, 2004, MAK, 2009). Hence, no classification and labelling for mutagenicity is required.

f) Carcinogenicity
No adequate experimental animal studies are available to evaluate the carcinogenicity of zinc compounds in humans.

g) Reproductive toxicity – classification criteria not met: Not reproductive toxic
Neither the impairment of fertility nor the developmental toxicity of the zinc category substances are considered endpoints of concern for humans. Based on the available information in experimental animals as well as in humans, there is no reason to classify any of the zinc category substances for reproductive toxicity in accordance with regulation (EC) 1272/2008.

h) Specific Target Organ Toxicity – STOT-single exposure: Zochem's ZnO product has no STOT
Metal fume fever is N/A, will not occur using Zochem zinc oxide substance.

i) Specific Target Organ Toxicity- STOT-repeated exposure- Animal data – classification criteria not met
No repeat exposure STOT. No animal or human sufficient evidence for STOT repeated oral/inhalation exposure. In accordance with the criteria of regulation (EC) 1272/2008, none of the zinc category substances is classified for Specific target organ toxicity by repeated exposure (STOT-RE).

j) Aspiration hazard
No data available – not classifiable due to lack of data

11.2 **Information on other hazards**

11.2.1. **Endocrine disrupting properties**: Substance is not classified as an endocrine disruptor.
Zinc is essential and has no known endocrine disrupting properties.

Section 12: ECOLOGICAL INFORMATION
For the zinc substances, Ecotoxicity Reference Values (ERVs) are based on the soluble ion, Zn^{2+}, and are determined from the extensive datasets on acute and chronic ecotoxicity testing of soluble zinc salts.

12.1. **Toxicity**

a) Aquatic toxicity
The available high-quality data were normalized towards two sets of physico-chemical conditions, reflecting the required range of pH. Such normalization is possible because for zinc, well-established bioavailability models (so called "Biotic Ligand Models" or BLMs) exist for algae, invertebrates, and fish, that enable the prediction of **acute** and **chronic** zinc ecotoxicity as a function of physicochemical test conditions. The Acute aquatic toxicity database on zinc contains data on 59 species (5 algae, 29 invertebrates, 21 fish species, 3 amphibians and 1 aquatic plant). The chronic aquatic toxicity database on zinc contains high quality data on 41 species (17 taxonomic groups). The extensive database is presented in the CSR. In the e-SDS, only the outcome of analyses that defines the classification is reported.

Zinc Ecotoxicity Reference Values for aquatic toxicity

	Endpoint		Zn^{++} ion concentration	Species
Acute ecotoxicity	NOEC	pH 6	154 µg Zn/l	Daphnia magna
	NOEC	pH 8	41 µg Zn/l	Pseudokirchneriella subcapitata
Chronic ecotoxicity	NOEC	pH 6	99 µg Zn/l	Pseudokirchneriella subcapitata
	NOEC	pH 8	11 µg Zn/l	Pseudokirchneriella subcapitata

b) Sediment toxicity

Endpoint	Value range	Data source	PNEC extrapolation method
NOEC/ EC10	218 to 1101 µg Zn/l	7 benthic species	Species Sensitivity Distribution

c) Soil toxicity

Endpoint	Value range	Data source	PNEC extrapolation method

NOEC/ EC10	31.2 and 8003.5 mg Zn/kg dry weight (dw)	12 terrestrial plants, 10 invertebrates and 13 microbial endpoints	Species Sensitivity Distribution

d) Toxicity to micro-organisms in STP

Endpoint	Value	Test method	Data source	PNEC extrapolation method
NOEC	100 µg Zn/l	Nitrification inhibition test	Juliastuti et al. 2003	Assessment factor AF = 1

12.2. **Persistence and biodegradability**

Biodegradation is not applicable to metals/inorganic substances. An analysis on the removal of zinc from the water column has been presented as a surrogate for persistence.

12.3. **Bioaccumulative potential**

Due to homeostatic control mechanisms, bioaccumulation is not relevant to essential elements in general and to zinc in particular.

12.4. **Mobility in soil**

Distribution	Transport type	parameter	Result	Method
Soil - water	Adsorption	Log Kp	3.24 (0.30 – 4.31)	OECD 106

12.5. **Results of PBT and vPvB assessment**

PBT and vPvB criteria are not applicable to inorganic substances.

12.6. **Endocrine disruptive properties**

Substance is not classified as an endocrine disruptor. Zinc is essential and has no known endocrine disrupting properties.

SECTION 13: Disposal considerations

13.1 **Waste treatment methods**

This product is covered by the regulations on hazardous waste.
HP 14- Ecotoxic.
Dispose of substance and container by an approved waste disposal facility.
Empty packaging also regulated in EEA member countries and the UK.
Regulation (EU) No. 1357/2014 on waste as retained and amended in the UK law.
To prevent water pollution, do not open release.
Recyclable: Waste substance not co-mingled with other substances or mixtures may be recyclable.
Contact Zochem for further information

SECTION 14: Transport information

Table for transportation information within the EEA (European Economic Area) and the U.K.

	ADR/RID	IMDG	IATA
14.1 **UN number**	UN3077	UN3077	UN3077
14.2 **UN proper shipping name**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Oxide	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Oxide),	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Oxide)

		Marine polluant (Zinc oxide)	
14.3 Transport hazard Classes(es)	9 	9  *	9 
	ADR/RID	IMDG	IATA
	Hazard identification number: 90	Sea (IMO): not regulated	IATA Label: Miscellaneous
14.4 **Packing group**	III	III	III
14.5 **Environmental hazards**	Yes	Yes, Dangerous to the Environment	Yes
14.6 **Special precautions for users**	No	No	Yes (see below)
Additional information	Tunnel code (E)	none	
IATA special precautions for users IATA - Passenger & Cargo Aircraft: 1000 kg (Packing Instruction 956 for IBC's) IATA - Passenger & Cargo Aircraft: 400 kg (Packing Instruction 956 for Bags) IATA - Passenger & Cargo Aircraft: 30 kg (Packing Instruction Y956 for Limited Quantity) IATA - S.P.: A97, A158, A179			

Section 15. REGULATORY INFORMATION

15.1 **Safety, health and environmental regulations/legislation specific for the substance or mixture**.

This SDS is valid for use in the European Union member countries and the UK only.
This SDS is not valid outside the EU/EEA and the UK.
This SDS is compiled in accordance with SDS Regulation (EU) No. 2020/878, REACH Regulation (EC) No. 1907/2006, GHS/CLP (Classification, Labelling and Packaging Regulation No. EC 1272/2008), and for the purpose of UK, as per (EC) No. 1907/2006 as retained and amended in the UK law.

EU REACH Registration Numbers:
01-2119463881-32-0065 (Zochem ULC, Canada), 01-2119463881-32-0201 (Zochem LLC, USA).

UK REACH Registration Numbers:
UK-01-2666131289-7-0002 (Zochem ULC, Canada), UK-20-9198436791-1-0000 (Zochem LLC, USA)

REACH OR contact: phone: 44(0) 1565 748111, email: alerts@RORltd.com, Website: www.rorltd.com

German Water Hazard Class (Stoff Nr. 2187): Class 2.

Country of Origin (CoO): Transocean shipments from Zochem in North America are normally exported from Zochem ULC Canada. A lesser number of Transocean orders export from Zochem LLC U.S.A.

SVHC: Zinc oxide is not an SVHC. Impurities are below SVHC or candidate SVHC thresholds.

Nano: This product is not nano (over 50% of substance particles by number are over 100 nm size).

Inventory/Lists.

TSCA (U.S.):	Yes, listed, notification not required.		
DSL (Canada):	Yes, listed.	NDSL: (Canada):	No, not listed, notification not required.
EINECS (Europe):	Yes, on Inventory.	ELINCS (Europe):	No, notification/reporting not required.

Listed on the following lists: ASIA-PAC, SWISS, PICCS (Philippines), ENCS (Japan), AICS (Australia), KECI (Korea), IECSC (China), New Zealand, Taiwan.

U.S. Regulations:

Transportation:	Not transport regulated in the U.S. (USDOT 49CFR172), Canada, or Mexico. 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.
CA Prop. 65:	No, ZnO is not a Prop 65 listed substance. Impurities Pb & Cd listed.
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.
ODS/ODC 82:	No ozone depleting substances.
USFDA:	Approved by FDA. Substance is listed as GRAS at 21CFR182.8991 (GRAS=Generally Recognized as Safe) and may be used in any FDA regulation where use of a GRAS substances is authorized including an ingredient in food and in food contact in rubber articles at 21CFR177.2600(c)(1); Food can linings and coatings at 21CFR175.300(b)(2), and Plastics at 21CFR170.30(d).

SECTION 16: Other information

16.1 Date of revision: 12December2025. Revised to comply with updated regulations Canada WHMIS Canada HPR, USOSHA Hazard Communication, and EU Regulation 2020/878.

16.2 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)

16.3 Extended SDS (eSDS)
Contact Zochem for eSDS Exposure Scenario for Communication

16. 4 Error or Omission
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.