

MATERIAL SAFETY DATA SHEET (MSDS)

ZINC OXIDE

SECTION 1 - PRODUCER & SUPPLIERS DETAILS

Manufacturer & Supplier: NUMINOR CHEMICAL INDUSTRIES LTD.

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SECTION 2 - CHEMICAL NAME & INFORMATION ON INGREDIENTS

Chemical Name: Zinc Oxide (CAS : 1314 - 13 - 2) (EINECS: 215-222-5)
Symbol: N  Dangerous for the Environment

R-Phrases: R50/53- Very toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

Formula: ZnO
Synonyms: Chinese White, Zinkweiss, Zinc monoxide, Zinc Flowers
% Range: 99 - 100%

Trace materials normally not exceeding 0.5%

There are no physically added chemical substances. The impurities are inherent to the raw materials used in the production of Zinc Oxide

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Melting Point: Above 1800°C
Specific Gravity: 5.61
Solubility in water: None or very low.
Mol Wt. 81.37
Appearance & Odour: White, light gray or pale yellow powder, odourless

SECTION 4 - HAZARDS IDENTIFICATION

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| Physical / chemical hazards : | The data available does not support any physical or chemical hazard. |
| Environmental hazard : | R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| Adverse human health effects | |
| - Inhalation : | May cause irritation to the respiratory tract. |
| - Skin contact : | Repeated or prolonged skin contact may cause irritation. |
| - Eye contact : | Excessive dust exposure may cause minor eyes irritation. |
| - Ingestion : | Health hazard if ingested in large quantities, can cause abdominal pain, nausea, cramps. |

SECTION 5 - FIRE, FIGHTING & EXPLOSION DATA

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| Fire: | Non Combustible. |
| Flammability: | Non Flammable |
| Flash point: | Not combustible |
| Extinguishing media: | In case of fire in immediate vicinity use any extinguishing agent. |
| Protection of fire-fighters: | Use breathing apparatus (self-contained breathing apparatus with full face shield). Wear suitable protective clothing. |
| Hazardous combustion and decomposition products | None. |

SECTION 6 - STABILITY & REACTIVITY DATA

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| Stability: | Stable under ordinary conditions |
| Hazardous Reactions: | None |

Incompatibility (materials to avoid):

1. Heated Magnesium 2. Chlorinated Rubber above 215c 3. Acids and Bases

SECTION 7 - Toxicological Information

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| Acute toxicity | |
| - Inhalation: | (rat) 4 hours LC50 > 5.7 mg ZnO/l Klimisch et al. 1982 |
| - Dermal: | No data available. |
| - Ingestion: | (rat) LD50 >15000 mg ZnO/kg OECD 401 |
| Dermal irritation (rabbit): | Not irritant. OECD 404 |
| Eyes irritation (rabbit): | Not irritant. OECD 405 |
| Chronic toxicity: | 50 mg ZnO/ day |

(Section 7 continued-Toxicological Information)

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- Sensitization:** (guinea-pig) This product has been reported not to cause skin sensitization (Magnusson & Kligman)
- Carcinogenicity:** No evidence of carcinogenicity in laboratory animals. No evidence of carcinogenicity in man.
- Mutagenicity:** In vitro and in vivo test of short-term genotoxicity : no evidence of genotoxicity.
- Reproductive toxicity:** No experimental or epidemiological evidence of reproduction toxicity. Teratogenicity
- Other toxicological information:** Zinc fume fever is attributable to exposure to ultra-fine zinc oxide particles (generated for example during welding and cutting of galvanised steel), but is not experienced in inhalation exposure to commercially traded Zinc Oxide.
- Rat inhalation LC50 [mg/l/4h]:** > 5.7 ZnO

SECTION 8 - FIRST AID MEASURES

- Effects and symptoms:** No specific effects and/or symptoms have been reported or known.
- First aid**
- **Skin contact:** Rinse immediately with plenty of water
 - **Inhalation:** Remove victim to fresh air.
If feeling unwell, immediately seek medical attention.
 - **Eye contact:** Rinse immediately with clean water for 15 minutes.
If feeling unwell, immediately seek medical attention.
 - **Ingestion:** Immediately rinse mouth with water.
Do not induce vomiting. Give water to drink.
If feeling unwell, immediately seek medical attention.
- Protection of rescue personnel:** Avoid all unnecessary exposure. Use appropriate protection (see Section 9).

SECTION 9 - PERSONAL PROTECTION & EXPOSURE CONTROLS

- **Respiratory protection:** Respiratory protection equipment not absolutely necessary.
 - **Hand protection:** Gloves.
Material: leather gloves, cotton gloves, rubber gloves.
 - **Skin protection:** Work clothes.
 - **Eye protection:** Chemical goggles or safety glasses.
- Occupational Exposure Limits**
- 8 Hour TLV-TWA [mg/m3] :** 10 (Dust)
5 (fume)
- Engineering measures:** Mechanical ventilation is recommended.
- Belgium 2002:**
- 15 minutes TLV-STEL [mg/m3/]:** 10 (fume)

SECTION 10 - ACCIDENTAL RELEASE MEASURES & SPILL LEAK PROCEDURES

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| Personal precautions: | Wear suitable gloves and eye/face protection. Avoid dust creation. |
| Environmental precautions: | Do not let product enter drains, sewage system, ground water. |
| Methods for cleaning up: | Sweep up and shovel into suitable containers for disposal. Re-use or recycle waste. |

SECTION 11 - HANDLING AND STORAGE

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| Handling & storing: | Good housekeeping - store in a cool dry place - keep containers shut. Avoid making dust. |
| Packing Materials: | All materials suitable. |

SECTION 12 - ECOLOGICAL INFORMATION

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| Persistence and degradability: | Not applicable. |
| Bioaccumulative potential: | Not applicable. |
| WGK (Germany): | 2 |
| Ecotoxicity: | EC50 (Selenastrum capricornutum, 72 H): 170 µg ZnO/I (LISEC 1997) |
| Mobility: | Not applicable. |

SECTION 13 - DISPOSAL CONSIDERATIONS

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| Disposal: | Comply with local regulations for disposal. |
| Waste of residues: | S60 - This material and its container must be disposed of as hazardous waste. Because of possible pollution, remove as industrial waste or hazardous waste. |
| Contaminated packaging: | Keep waste packaging separate. Because of possible pollution, remove as industrial waste or hazardous waste. |

SECTION 14 - TRANSPORT INFORMATION

Hazard Labels:



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| H.S. Code: | 2833.00 | |
| UN - No: | 3077 | |
| ADR/RID/ADNR/IMO-IMDG: | Class 9 | |
| H.I. No.: | 90 | |
| Shipping Name: | 3077 Environmentally Hazardous Substance, Solid, 9, III, ADR | N.O.S., |
| Packaging Group: | III | |
| IMDG-Marine Pollution | YES | |
| EMS No. | F-A, S-F | |
| MFAG Table | 1 | |

IATA Details:

UN #: 3077, Class 9, PG III
Proper Shipping Name: Environmentally Hazardous
Substance, Solid, N.O.S.,
Inhalation Packing Group I: No

SECTION 15 - REGULATORY INFORMATION

Symbol:



N



N Dangerous for the Environment

R Phrase(s): R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S Phrase(s): S60 - This material and its container must be disposed of as hazardous waste.
S61 - Avoid release to the environment. Refer to special instructions/Safety datasheets.

SECTION 16 - OTHER INFORMATION

Date of Issue: Dec. 2000
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MSDS prepared by: AVK

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