SAFETY DATA SHEET

according to regulation (EG) Nr. 1907/2006

Date of issue: 09.10.2013 Revision date: 26.07.2016 Version: 2.2

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1 Product identifiers

Product name:	Zinc oxide (depleted in zinc-64)
EC-No. (not depleted):	215-222-5
CAS-No. (not depleted):	1314-13-2
Index-No. (not depleted):	030-013-00-7
REACH Registration no.:	Not required

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses:	Corrosive prevention

1.3 Details of the supplier of the safety data sheet

Supplier:	NUKEM Isotopes GmbH, Industriestrasse 13, 63755 Alzenau, Germany
Telephone:	+49 (0)6023 91 1726
Telefax:	+49 (0)6023 91 1614
Email:	Christian.Schuch@nukemisotopes.de

1.4 Emergency telephone number

24 hr. Emergency Telephone:	**+1-703-253-4254** (English / Contract No.: 01009)

2. HAZARDS INDICATION

2.1 Classification of the substance or mixture

Classification according to regulation (EC) No. 1272/2008

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), 410

For the full text of the H-Statements mentioned in this section, see section 2.2

Classification according to directive 67/548/EEG or directive 1999/45/EG

Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.

N: Dangerous for the environment.

R-Phrases:

R 50/53 Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.

2.2 Label elements

Labeling according to Regulation (EG) Nr. 1272/2008

The substance is classified and labelled according to the CLP regulation.

Hazard Pictograms:

GHS09

Signal word:

Warning

Hazard statements:

H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P273:	Avoid release to the environment.

2.3 Other hazards

All chemicals are potentially dangerous. They should only be handled by specially trained personnel.

Results of PBT- und vPvB-assessment:

PBT: Not applicable.

vPvB: Not applicable.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Chemical characterization

Substance:

Description:	Depleted zinc oxide (depleted in zinc-64)
CAS-No. (not depleted):	1314-13-2
EG-No. (not depleted):	215-222-5
Index-No. (not depleted):	030-013-00-7
Formula:	ZnO
Molar mass [g/mol]:	ca. 81

4. FIRST AID MEASURES

4.1 Description of first aid measures

General information:

First Aider: Pay attention to self-protection! Consult a physician and show this safety data sheet to the doctor in attendance.

Oral Exposure:

If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Call a physician immediately.

Inhalation Exposure:

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Call a physician

Dermal Exposure:

Remove contaminated clothing and shoes. Wash off with soap and plenty of water. Call a physician.

Eye Exposure:

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Zinc oxide dust or fume can irritate the respiratory tract. Prolonged skin contact can produce a severe dermatitis called oxide pox. Exposure to high levels of dust or fume can cause metallic taste, marked thirst, coughing, fatigue, weakness, muscular pain, and nausea followed by fever and chills. Severe

overexposure may result in bronchitis or pneumonia with a bluish tint to the skin. Prolonged or repeated exposure can cause reversible liver enzyme abnormalities and Diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

No further information available.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing agents:

Use water spray, carbon dioxide, dry chemical powder or carbon dioxide. Use fire extinguishing methods suitable to surrounding conditions.

5.2 Special hazards arising from the substance or mixture

Zinc, zinc oxides.

5.3 Advice for firefighters

Protective equipment:

Wear self-contained breathing apparatus for firefighting if necessary.

Specific Hazard(s):

No information available.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation and avoid breathing dust. Ensure adequate ventilation. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided

6.3 Methods and material for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid formation of dust and aerosols and avoid contact with skin and eyes. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

A part from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

Components with workplace control parameters.

8.2 Exposure controls

Appropriate engineering controls:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

Individual protection measures, such as personal protective equipment:

Body protection:

Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace

Respiratory protection:

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Eye protection:

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Hand protection:

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

8.3 Environmental exposure control

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL/CHEMICAL PROPERTIES

General Information

Appearance:	Form: Pellets
	Color: White
Odor:	Odorless
Odor threshold:	No information available.
pH-value:	7
Melting point/Melting range:	1975 °C
Boiling point/Boiling range:	No information available.
Flash point:	No information available.
Flammability (solid, gaseous):	No information available.
Ignition temperature:	No information available.
Decomposition temperature:	No information available
Self-igniting:	No information available
Danger of explosion:	Contact with magnesium (and heat).
Explosion limits:	Lower: No information available.
	Upper: No information available.
Oxidizing properties:	No information available.
Vapor pressure:	No information available.
Relative Density:	5.61 g/cm³

Vapor density:	No information available.
Evaporation rate:	No information available.
Solubility in / Miscibility with water at 29 °C:	0.0016 g/l
Partition coefficient (n-octanol/water):	No information available.
Viscosity, dynamic:	No information available.

10. STABILITY AND REACTIVITY

10.1 Reactivity

No information available.

10.2 Chemical stability

Stable if used and stored according to specifications.

10.3 Possibility of hazardous reactions

The substance can react dangerously with:

Chlorinated rubber (rare).
Linseed oil (rare).

10.4 Conditions to avoid

Magnesium (heat).

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Thermal very stable.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:

LD/LC50 values relevant for classification

- Oral LD50 (mouse): 7950 mg/kg
- Inhalation (mouse): 2500 mg/kg

Primary irritant effect:

Inhalation:

- May be harmful if inhaled. May cause respiratory tract irritation.

Ingestion:

- May be harmful if swallowed.

Skin:

- May be harmful if absorbed through skin. May cause skin irritation.

Eyes:

- Causes eye irritation.

11.2 Signs and Symptoms of Exposure

Zinc oxide dust or fume can irritate the respiratory tract. Prolonged skin contact can produce a severe dermatitis called oxide pox. Exposure to high levels of dust or fume can cause metallic taste, marked thirst, coughing, fatigue, weakness, muscular pain, and nausea followed by fever and chills. Severe overexposure may result in bronchitis or pneumonia with a bluish tint to the skin. Prolonged or repeated exposure can cause reversible liver enzyme abnormalities.

11.3 Additional toxicological information

The product should be handled with the care usual when dealing with chemicals.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish:

LC50 - Oncorhynchus mykiss (rainbow trout) - 1,1 mg/l - 96,0 h

Toxicity to daphnia and other aquatic invertebrates:

EC50 - Daphnia magna (Water flea) - 0,098 mg/l - 48 h

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

No information available

12.6 Other adverse effects

Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment methods

Product:

Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Uncleaned packaging:

Dispose of as unused product.

14. TRANSPORT INFORMATION

14.1 UN-Number

ADR/RID, IMDG, IATA:	3077

14.2 UN proper shipping name

ADR/RID:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc oxide)
IMDG:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc oxide)
IATA:	Environmentally hazardous substance, solid, n.o.s. (Zinc oxide)

14.3 Transport hazard class(es)

ADR/RID, IMDG, IATA: 9

14.4 Packing group

ADR/RID, IMDG, IATA:	III

14.5 Environmental hazards:

ADR/RID:	yes
IMDG Marine pollutant:	yes
IATA:	yes

14.6 Special precautions for user Warning: Corrosive substances.

No information available.

14.7 Transport/Additional information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3, IATA Special Provision A197) for single packaging and combination packaging containing inner packaging with dangerous goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

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

No information available.

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Disclaimer

Product is supplied for research and laboratory use only. Not for drug, household or other uses.

Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. See invoice or packing slip for additional terms and conditions of sale.