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

1.1. Product identifier
Product form : Mixture
Product name : MICROENCAPSULATED ZINC OXIDE

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

1.2.1. Relevant identified uses
Use of the substance/mixture : Food-stuff industry

1.2.2. Uses advised against
No additional information available

1.3. Details of the supplier of the safety data sheet
Manufacturer : JOST CHEMICAL CO.
8150 Lackland
Saint Louis
MO 63114
USA
T : +1 314-428-4300 / F : +1 314-428-4366

Distributor : JOST CHEMICAL EUROPE SPRL
Rue du Bois Portal 30/1-3
B - 5300 Andenne
BELGIOUE
T : +32 85 552 655 / F : +32 85 552 654
info@josteurope.com

1.4. Emergency telephone number

<table>
<thead>
<tr>
<th>Country</th>
<th>Organisation/Company</th>
<th>Address</th>
<th>Emergency number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNITED KINGDOM</td>
<td>National Poisons Information Service</td>
<td>Dudley Road 818 7QH Birmingham</td>
<td>0844 892 0111 (UK only, Monday to Friday, 08.00 to 18.00 hours)</td>
</tr>
<tr>
<td></td>
<td>(Birmingham Centre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>City Hospital</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Aquatic Acute 1 H400
Aquatic Chronic 1 H410

Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]
N; R50/53
Full text of R-phrases: see section 16

Adverse physicochemical, human health and environmental effects
Very toxic to aquatic life with long lasting effects. Not classified as flammable according to EC criteria, but may present a risk in the event of a fire.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) : ☢️

Signal word (CLP) : Warning

Hazard statements (CLP) : H410 - Very toxic to aquatic life with long lasting effects
Precautionary statements (CLP) : P273 - Avoid release to the environment
P501 - Dispose of this material and its container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
2.3. Other hazards

Other hazards not contributing to the classification: None, to our knowledge.

SECTION 3: Composition/information on ingredients

3.1. Substance
Not applicable

3.2. Mixture
Description: Microencapsulated Zinc Oxide

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Directive 67/548/EEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>zinc oxide</td>
<td>(CAS No) 1314-13-2 (EC no) 215-222-5 (EC index no) 030-013-00-7</td>
<td>&gt; 25</td>
<td>N; R50/53</td>
</tr>
<tr>
<td></td>
<td>(CAS No) 1314-13-2 (EC no) 215-222-5 (EC index no) 030-013-00-7</td>
<td>&gt; 25</td>
<td>Classification according to Regulation (EC) No. 1272/2008 [CLP]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Acute 1, H400</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic 1, H410</td>
</tr>
</tbody>
</table>

Full text of R- and H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Move the affected person away from the contaminated area and into the fresh air. If you feel unwell, seek medical advice.

First-aid measures after skin contact: Wash with soapy water. If case of redness or irritation, call a doctor.

First-aid measures after eye contact: Rinse with water while holding the eyes wide open. Consult an eye specialist if necessary.

First-aid measures after ingestion: Never attempt to induce vomiting. Consult a doctor/medical service if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO2). Water spray. Dry chemical.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire: During combustion: Toxic fumes may be released, Zinc oxide (fumes).

5.3. Advice for firefighters

Firefighting instructions: Contain the extinguishing fluids by bunding (the product is hazardous for the environment).

Protection during firefighting: Do not attempt to take action without suitable protective equipment. Complete protective clothing. Self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures: Ventilate spillage area.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: “Exposure controls/personal protection”.

6.2. Environmental precautions

Do not allow product to spread into the environment.

6.3. Methods and material for containment and cleaning up

For containment: Sweep up or vacuum up the product. Avoid creating or spreading dust.

Methods for cleaning up: Dispose of contaminated materials in accordance with current regulations.
6.4. Reference to other sections
For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Precautions for safe handling: Ensure good ventilation of the work station. Dust extraction (suction). Avoid contact with skin and eyes. Avoid the formation or spread of dust in the atmosphere.

Hygiene measures: Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures: Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

Storage conditions: Keep container tightly closed and dry. Store in a cool, well-ventilated place. Protect from light.


7.3. Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>MICROENCAPSULATED ZINC OXIDE</th>
<th>DNEL/DMEL (Workers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term - systemic effects, dermal</td>
<td>83 mg/kg bodyweight/day</td>
</tr>
<tr>
<td>Long-term - systemic effects, inhalation</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>DNEL/DMEL (General population)</td>
<td></td>
</tr>
<tr>
<td>Long-term - systemic effects, oral</td>
<td>0.83 mg/kg bodyweight/day</td>
</tr>
<tr>
<td>Long-term - systemic effects, inhalation</td>
<td>2.5 mg/m³</td>
</tr>
<tr>
<td>Long-term - systemic effects, dermal</td>
<td>83 mg/kg bodyweight/day</td>
</tr>
<tr>
<td>PNEC (Water)</td>
<td></td>
</tr>
<tr>
<td>PNEC aqua (freshwater)</td>
<td>20.9 µg/l</td>
</tr>
<tr>
<td>PNEC aqua (marine water)</td>
<td>6.1 µg/l</td>
</tr>
<tr>
<td>PNEC (Sediment)</td>
<td></td>
</tr>
<tr>
<td>PNEC sediment (freshwater)</td>
<td>117.8 mg/l</td>
</tr>
<tr>
<td>PNEC sediment (marine water)</td>
<td>56.5 mg/l</td>
</tr>
<tr>
<td>PNEC (Soil)</td>
<td></td>
</tr>
<tr>
<td>PNEC soil</td>
<td>35.6 mg/kg dwt</td>
</tr>
<tr>
<td>PNEC (STP)</td>
<td></td>
</tr>
<tr>
<td>PNEC sewage treatment plant</td>
<td>52 µg/l</td>
</tr>
</tbody>
</table>

8.2. Exposure controls
Appropriate engineering controls: Ensure good ventilation of the work station. Extraction to remove dust at its source.

Hand protection: Protective gloves made of rubber. The protective gloves to be used must comply with the specifications of EC directive 89/686/EEC and the resultant standard EN 374. Breakthrough time: refer to the recommendations of the supplier.

Eye protection: Safety goggles.

Skin and body protection: Protective clothing.

Respiratory protection: If the occupational exposure limit is exceeded: suitable respiratory equipment (breathing apparatus with filter): P2/P3.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| Physical state | Solid |
| Appearance | Crystalline powder. |
| Colour | White. |
| Odour | Characteristic. |
| Odour threshold | No data available |
| pH | No data available |
| Relative evaporation rate (butyl acetate=1) | No data available |
| Melting point | Not applicable (Decomposes) |
| Freezing point | Not applicable |
Boiling point: Not applicable
Flash point: Not applicable
Auto-ignition temperature: Non flammable
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapour pressure: Not applicable
Relative vapour density at 20 °C: No data available
Relative density: No data available
Solubility: Water: Insoluble
Log Pow: Not applicable
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosive properties: Not explosive.
Oxidising properties: Non oxidizing material according to EC criteria.
Explosive limits: Not applicable

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
To our knowledge, the product does not present any particular risk.

10.2. Chemical stability
Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions
None under normal conditions.

10.4. Conditions to avoid
None to our knowledge.

10.5. Incompatible materials
Acids. Bases.

10.6. Hazardous decomposition products
On thermal decomposition (pyrolysis), releases: Zinc oxide (fumes).

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Not classified (Based on available data, the classification criteria are not met)

<table>
<thead>
<tr>
<th>ZnO (1314-13-2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>&gt; 5000 mg/kg (OECD 401 method)</td>
</tr>
<tr>
<td>LD50 dermal rabbit</td>
<td>&gt; 2000 mg/kg</td>
</tr>
<tr>
<td>LC50 inhalation rat</td>
<td>&gt; 5700 mg/m³ (equivalent or similar to OECD Guideline 403)</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified (Based on available data, the classification criteria are not met)
Zinc oxide: Not irritating to rabbits on cutaneous application (OECD 404 method)

Serious eye damage/irritation: Not classified (Based on available data, the classification criteria are not met)
Zinc oxide: Not irritating to rabbits on ocular application (OECD 405)

Respiratory or skin sensitisation: Not classified (Based on available data, the classification criteria are not met)
Zinc oxide: Does not cause cutaneous sensitisation for guinea-pigs (OECD 406)

Germ cell mutagenicity: Not classified (Based on available data, the classification criteria are not met)
Zinc oxide: Ames test (with and without metabolic activation): negative (OECD 471)

Carcinogenicity: Not classified (Based on available data, the classification criteria are not met)

Reproductive toxicity: Not classified (Based on available data, the classification criteria are not met)

Specific target organ toxicity (single exposure): Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity (repeated exposure) : Not classified (Based on available data, the classification criteria are not met)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>zinc oxide (1314-13-2)</strong></td>
<td></td>
</tr>
<tr>
<td>NOAEL (inhalation, rat, dust/mist/fume, 90 days)</td>
<td>1,5 mg/m³ (OECD 413 method)</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Not classified (Based on available data, the classification criteria are not met)</td>
</tr>
</tbody>
</table>

**SECTION 12: Ecological information**

12.1. **Toxicity**

Ecology - general : Very toxic to aquatic life with long lasting effects.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>zinc oxide (1314-13-2)</strong></td>
<td></td>
</tr>
<tr>
<td>LC50 fish</td>
<td>1,793 mg/l/96h Brachydanio rerio (zebra-fish)</td>
</tr>
<tr>
<td>EC50 Daphnia</td>
<td>6,9 mg/l/48h (Daphnia magna)(OECD 202 method)</td>
</tr>
<tr>
<td>NOEC (chronic)</td>
<td>&gt;= 540 µg/l (32 days) Brachydanio rerio (zebra-fish) (OECD TG 210 method)</td>
</tr>
<tr>
<td>NOEC chronic crustacea</td>
<td>24 µg/l (Selenastrum capricornutum) 3days</td>
</tr>
</tbody>
</table>

12.2. **Persistence and degradability**

No additional information available

12.3. **Bioaccumulative potential**

No additional information available

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>zinc oxide (1314-13-2)</strong></td>
<td></td>
</tr>
<tr>
<td>Log Pow</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

12.4. **Mobility in soil**

No additional information available

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

No additional information available

12.6. **Other adverse effects**

No additional information available

**SECTION 13: Disposal considerations**

13.1. **Waste treatment methods**

Waste treatment methods : Dispose of in accordance with relevant local regulations.

Waste disposal recommendations : Destroy at an authorised site.

Additional information : The user's attention is drawn to the possible existence of specific European, national or local regulations regarding disposal.

**SECTION 14: Transport information**

In accordance with ADR / RID / IMDG / IATA / ADN

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>IMDG</td>
</tr>
<tr>
<td>14.1. UN number</td>
<td>3077</td>
</tr>
<tr>
<td></td>
<td>3077</td>
</tr>
<tr>
<td></td>
<td>3077</td>
</tr>
<tr>
<td>14.2. UN proper shipping name</td>
<td>Environmentally hazardous substance, solid, n.o.s.</td>
</tr>
<tr>
<td>ENVIROMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.</td>
</tr>
<tr>
<td></td>
<td>Environmentally hazardous substance, solid, n.o.s.</td>
</tr>
<tr>
<td>Transport document description</td>
<td></td>
</tr>
<tr>
<td>UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (zinc oxide(1314-13-2)), 9, III, (E)</td>
<td>UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (zinc oxide(1314-13-2)), 9, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>14.3. Transport hazard class(es)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>14.4. Packing group</td>
<td>III</td>
</tr>
</tbody>
</table>

21/04/2015 EN (English) 5/7
MICROENCAPSULATED ZINC OXIDE
Safety Data Sheet
according to Regulation (EC) No. 453/2010

14.5. Environmental hazards

<table>
<thead>
<tr>
<th>ADR</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dangerous for the environment : Yes</td>
<td>Dangerous for the environment : Yes</td>
<td>Dangerous for the environment : Yes</td>
</tr>
<tr>
<td>Marine pollutant : Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14.6. Special precautions for user

14.6.1. Overland transport

Classification code (ADR) : M7
Special provisions (ADR) : 274, 335, 601
Limited quantities (ADR) : 5kg
Excepted quantities (ADR) : E1
Packing instructions (ADR) : P002, IBC08, LP02, R001
Special packing provisions (ADR) : PP12, B3
Mixed packing provisions (ADR) : MP10
Portable tank and bulk container instructions (ADR) : T1, BK1, BK2
Portable tank and bulk container special provisions (ADR) : TP33
Tank code (ADR) : SGAV, LGBV
Vehicle for tank carriage : AT
Transport category (ADR) : 3
Special provisions for carriage - Packages (ADR) : V13
Special provisions for carriage - Bulk (ADR) : VV1
Special provisions for carriage - Loading, unloading and handling (ADR) : CV13
Hazard identification number (Kemler No.) : 90
Orange plates

Tunnel restriction code (ADR) : E
EAC code : 2Z

14.6.2. Transport by sea

Special provisions (IMDG) : 274, 335, 966, 967
Limited quantities (IMDG) : 5 kg
Excepted quantities (IMDG) : E1
Packing instructions (IMDG) : P002, LP02
Special packing provisions (IMDG) : PP12
IBC packing instructions (IMDG) : IBC08
IBC special provisions (IMDG) : B3
Tank instructions (IMDG) : T1, BK1, BK2, BK3
Tank special provisions (IMDG) : TP33
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-F
Stowage category (IMDG) : A
MFAG-No : 171

14.6.3. Air transport

PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Y956
PCA limited quantity max net quantity (IATA) : 30kgG
PCA packing instructions (IATA) : 956
PCA max net quantity (IATA) : 400kg
CAO packing instructions (IATA) : 956
CAO max net quantity (IATA) : 400kg
Special provisions (IATA) : A97, A158, A179
ERG code (IATA) : 9L

21/04/2015 EN (English) 6/7
14.6.4. Inland waterway transport
Not applicable

14.6.5. Rail transport
Not applicable

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations
Contains no substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances

15.1.2. National regulations
No additional information available

15.2. Chemical safety assessment
No chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:
This sheet was updated (refer to the date at the top of this page). SDS changed section(s) : 1-11-12.

Data sources

Other information
This product must not be used for other applications that mentioned in §1. Safety data sheet established by : LISAM SERVICES - TELEGIS 17, Rue de la Couture F-60400 PASSEL Safety Made Easy with www.lisam.com.

Full text of R-, H- and EUH-phrases:

<table>
<thead>
<tr>
<th>Acquatic Acute 1</th>
<th>Hazardous to the aquatic environment — Acute Hazard, Category 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquatic Chronic 1</td>
<td>Hazardous to the aquatic environment — Chronic Hazard, Category 1</td>
</tr>
<tr>
<td>H400</td>
<td>Very toxic to aquatic life</td>
</tr>
<tr>
<td>H410</td>
<td>Very toxic to aquatic life with long lasting effects</td>
</tr>
<tr>
<td>R50/53</td>
<td>Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment</td>
</tr>
<tr>
<td>N</td>
<td>Dangerous for the environment</td>
</tr>
</tbody>
</table>

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

<table>
<thead>
<tr>
<th>Acquatic Acute 1</th>
<th>H400</th>
<th>Annex VII conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquatic Chronic 1</td>
<td>H410</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

SDS EU (REACH Annex II)
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.