SAFETY DATA SHEET

PRODUCT NAME: Zinc Oxide (ALL GRADES)
EFFECTIVE DATE: 9 October 2019
SCOPE: This SDS is valid for all Zinc Oxide product grades sold internationally by US Zinc, excluding USA sales

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

1.1 Product Identifier
   Trade Name: Zinc Oxide
   Synonyms: ZINKOXID, OXYDE DE ZINC, OSSIDO DI ZINCO, ZINKOXIDE, ZINK OXID, OXIDO DEL CINC, TLENED CYNKU, CHINESE WHITE
   CAS number: 1314-13-2
   EINECS number: 215-222-5
   Reach Registration: 01-2119463881-32-0075 (Tonnage Band >1000 t/yr)

1.2 Relevant identified uses of the substance/mixture and uses advised against
   In EEA member countries, use is restricted to only uses registered under REACH.
   - Colouring agents, pigments
   - Food/feedstuff additives
   - Fuels and fuel additives
   - Intermediates
   - Laboratory chemicals
   - Lubricants and lubricant additives
   - Plating agents & metal surface treating agents
   - Process regulators,
   - component in batteries
   - Corrosion inhibitors and anti-scaling agents
   - Fertilisers
   - Pharmaceutical substance
   - Photosensitive agents & photo-chemicals
   - Process regulators, used in vulcanisation or polymerisation processes
   - Processing aid, not otherwise listed
   - Semiconductors

1.3 Details of the supplier of the data sheet

<table>
<thead>
<tr>
<th>Supplier Address</th>
<th>Supplier Phone</th>
<th>Supplier Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Zinc Corporation</td>
<td>+001 713 926 1705</td>
<td>Timothy McGrady</td>
</tr>
<tr>
<td>2727 Allen Parkway; Suite 800 Houston TX 77019</td>
<td>+001 713 924 4829</td>
<td><a href="mailto:HSE@USZinc.com">HSE@USZinc.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier Fax</th>
<th>Contact Email</th>
<th>Contact Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>+001 713 924 4829</td>
<td><a href="mailto:HSE@USZinc.com">HSE@USZinc.com</a></td>
<td>+001 281 840 5376</td>
</tr>
</tbody>
</table>

1.4 Emergency Contact

Phone Number: +001 888 298 3509
+001 760 602 8703 Use Client Code 10381
1.5 REACH Only Representative

(OR): Chemservice GmbH
OR Address: Herrnsheimer Hauptstr. 1b | 67550 Worms | Germany
OR contact person: Thomas Kremer, email: tkremer@chemservice-group.com
Tel: +352 270776 62
www.chemservice-group.com

2 HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 U.S.A.: Not Regulated
2.1.2 EEA member countries: Regulated
   2.1.2.1 Classification according to Regulation (EC) No 1272/2008 [CLP]
      Aquatic Acute 1: H400
      Aquatic Chronic 1, H410
   2.1.2.2 Classification according to Directive 67/548/EEC
      Dangerous for the environment; N; R50-53
   2.1.2.3 Additional Information
      For full text of R-phrases and Hazard- and EU Hazard-statements: see Section 16.

2.2 GHS Labeling

Zinc Oxide. Signal word: Warning.

H410: Very toxic to aquatic life with long lasting effects.
P273: Avoid release to the environment.
P391: Collect spillage.
P501: Dispose of contents/container as hazardous or special waste in accordance with applicable law.

– These warning labels only apply outside of USA unless transported by air or sea
GHS PRECAUTIONARY STATEMENTS

Hazard category | Signal word | Hazard statement
--- | --- | ---
1 | Warning | Very toxic to aquatic life with long lasting effects.

Precautionary statements:

**Prevention**
Keep only in original container or in similar tightly sealed container

**Response**
Absorb spillage to prevent material damage

**Storage**
Store in tightly sealed container

**Disposal**
Disposal as per local, state or federal regulations. Avoid water contamination

### 3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS#</th>
<th>EC#</th>
<th>% Composition</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Oxide (ZnO)</td>
<td>1314-13-2</td>
<td>215-222-5</td>
<td>95%-100%</td>
<td>Main</td>
</tr>
<tr>
<td>Lead (PbO)</td>
<td></td>
<td></td>
<td>≤0.05%</td>
<td>Impurity</td>
</tr>
<tr>
<td>Cadmium (CdO)</td>
<td></td>
<td></td>
<td>≤0.01%</td>
<td>Impurity</td>
</tr>
</tbody>
</table>

Note: all other constituents are found at trace levels or are not regulated. See individual product specifications for specific composition limits.
4 FIRST AID MEASURES

4.1 Description of first aid measures

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Immediately wash with soap and water. Seek medical attention if irritation occurs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Contact</td>
<td>Immediately flush eyes with plenty of water. Get medical attention if irritation occurs.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Drink plenty of water. Do not induce vomiting. Seek medical attention or contact Poison Control.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Remove victim to fresh air. Seek medical attention if feeling unwell or experiencing respiratory distress</td>
</tr>
</tbody>
</table>

4.2 Most important symptoms and effects, both acute and delayed

**Acute:** Dry cough, headache, throat irritation

**Delayed:** No delayed symptoms or effects expected

4.3 Indication of any immediate medical attention and special treatment needed

Bad cough, headache, and/or nausea. Move effected individual to fresh air.

5 FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

<table>
<thead>
<tr>
<th>Suitable Extinguishing Media</th>
<th>Use an extinguishing media suitable for the surrounding fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsuitable Extinguishing media</td>
<td>None Known</td>
</tr>
</tbody>
</table>

5.2 Special hazards arising from the substance or mixture

<table>
<thead>
<tr>
<th>Hazards from the substance</th>
<th>Water contaminated with this material must be contained and prevented from being discharged to environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous thermal decomposition products</td>
<td>Decomposition products may include Zinc Oxide fumes at high temperatures</td>
</tr>
</tbody>
</table>

5.3 Advice for fire-fighters

| Special protective actions for fire-fighters | No special measures required |
| Special protective equipment for fire-fighters | Suitable breathing apparatus |
6 ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions

Avoid breathing dust. Refer to Section 7 and Section 8 for advice on handling/storage and PPE

6.2 Environmental Precautions

Prevent contamination of soil, drains, and surface water. Inform relevant authorities of spill where required.

6.3 Spill Cleanup Recommendation

Avoid dry sweeping or other methods which raise dust. Vacuum or wet-sweep and place into a suitable closable, labeled container for disposal. Dispose of waste via licensed waste disposal contractor.

7 HANDLING AND STORAGE

7.1 Precautions for Safe Handling

This product should be used in accordance with good industrial safety practices and industrial hygiene standards and all local, state, federal, and international regulations. Avoid creating airborne dust. Ensure adequate exhaust ventilation. Workers who handle material should wear gloves and thoroughly wash hands/forearms after exposure. See Section 8.2 if exposure exceeds limits.

7.2 Conditions for Safe Storage/Instabilities

This product should be stored in accordance with all local, state, federal and international regulations. Store under ambient conditions and keep packaging free from high moisture areas in a well-ventilated space sealed tightly in the original containers. Once original containers are opened, all product must be used or remaining product placed in tightly sealed containers. Protect containers from damage and repair if damage occurs. If product is shipped in IBC bulk packaging, the inner plastic liner may be closed tightly and be considered a closed container. Use all product within 1 year of shipping date.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION
8.1 Control Parameters

<table>
<thead>
<tr>
<th>Product/Ingredient Name</th>
<th>8 Hour- TWA (mg/m$^3$)</th>
<th>15 min- STEL (mg/m$^3$)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>5 (Fumes) 10 (Dust)</td>
<td>10 (fumes)</td>
<td>ACGIH (1991) (guidance values)</td>
</tr>
<tr>
<td>USA</td>
<td>5 (Fumes) 15 (Dust; total) 5 (Dust; respirable)</td>
<td></td>
<td>OSHA (1989) (legal limit values)</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>5 (Fumes)</td>
<td></td>
<td>SZW (1997)</td>
</tr>
<tr>
<td>Germany</td>
<td>5 (Fumes) 6 (Dust)</td>
<td></td>
<td>DFG (1997)</td>
</tr>
<tr>
<td>UK</td>
<td>5 (Fumes) 10 (Dust)</td>
<td></td>
<td>HSE (1998)</td>
</tr>
<tr>
<td>Sweden</td>
<td>5 (Fumes)</td>
<td></td>
<td>National Board of Occupation Safety and Health, Sweden (1993)</td>
</tr>
<tr>
<td>Denmark</td>
<td>4 (Fumes) 10 (Dust)</td>
<td></td>
<td>Arbejdstilsynet (1992)</td>
</tr>
</tbody>
</table>

8.2 Exposure Controls

<table>
<thead>
<tr>
<th>Respiratory Protection</th>
<th>Avoid creating dust. If exposure levels exceed limits, respiratory protection approved for the work being performed must be worn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Protection</td>
<td>Always wear glove approved for the work being performed when handling Zinc Oxide.</td>
</tr>
<tr>
<td>Skin Protection</td>
<td>Wear normal chemical work clothing.</td>
</tr>
<tr>
<td>Eye Protection</td>
<td>Always wear approved protective eyewear if there is a potential for dust being created while handling the material.</td>
</tr>
<tr>
<td>General Protective Hygiene Measures</td>
<td>Use local exhaust ventilation to pro-actively reduce dust levels.</td>
</tr>
</tbody>
</table>

8.3 Other

<table>
<thead>
<tr>
<th>Route(s) of entry</th>
<th>Inhalation and mechanical irritation of eyes and skin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogen Status</td>
<td>Not a NTP/IARC carcinogen</td>
</tr>
<tr>
<td>Signs and symptoms of exposure</td>
<td>Dry throat, cough, and dry itchy skin</td>
</tr>
<tr>
<td>Notes</td>
<td>Excess bulk exposure may cause acute respiratory irritation or dry skin</td>
</tr>
</tbody>
</table>
9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White, cream, or yellow</td>
</tr>
<tr>
<td>Typical Particle Size:</td>
<td>d50 typically 1 um</td>
</tr>
<tr>
<td>Flammability Limits:</td>
<td>ZnO is not flammable</td>
</tr>
<tr>
<td>Explosive Limits:</td>
<td>ZnO is not explosive</td>
</tr>
<tr>
<td>Odor:</td>
<td>Odorless</td>
</tr>
<tr>
<td>Vapor Pressure:</td>
<td>@1500°C = 12 mm HG</td>
</tr>
<tr>
<td>Odor Threshold:</td>
<td>Odorless</td>
</tr>
<tr>
<td>pH:</td>
<td>Neutral</td>
</tr>
<tr>
<td>Relative Density:</td>
<td>Varies</td>
</tr>
<tr>
<td>Melting point:</td>
<td>1975 °C</td>
</tr>
<tr>
<td>Solubility in water:</td>
<td>2.9 mg/L</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>n/a</td>
</tr>
<tr>
<td>Flash Point:</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>n/a</td>
</tr>
<tr>
<td>Specific Gravity:</td>
<td>5.68</td>
</tr>
<tr>
<td>Molecular Weight:</td>
<td>81.38</td>
</tr>
<tr>
<td>Suggested Solvents:</td>
<td>Acids and bases</td>
</tr>
<tr>
<td>Fire qualities:</td>
<td>Will not burn</td>
</tr>
<tr>
<td>Explosive Qualities:</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Volatile:</td>
<td>0.3% nominal</td>
</tr>
</tbody>
</table>

10 STABILITY AND REACTIVITY

- Reactivity: Stable under normal, dry conditions
- Chemical stability: This product is stable
- Possibility of hazardous reactions: None
- Conditions to avoid or incompatible materials: Heated magnesium. Chlorinated rubbers above 215°C
- Hazardous decomposition products: Potential for ZnO fumes at elevated temperatures

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

<table>
<thead>
<tr>
<th>Routes of Entry</th>
<th>Oral, Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>LD₅₀ (rat, Inhalation): 7,950 mg/kg (Encyclopedia of Toxicology: Reference Book 2005)</td>
</tr>
<tr>
<td>Chronic Toxicity</td>
<td>NOAEL: 50 mg/day (based on human clinical studies)</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No data available</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>No data available. Not listed as an IARC Carcinogen. Not listed in the NTP report on carcinogens.</td>
</tr>
</tbody>
</table>

11.2 Acute Exposure Symptoms
12 ECOLOGICAL INFORMATION

12.1 Toxicity

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Oxide</td>
<td>LC50 Inhalation</td>
<td>Rat</td>
<td>&gt;5.7mg/L</td>
<td>4 Hours</td>
<td>Klimisch and Freisberg (1982)</td>
</tr>
<tr>
<td></td>
<td>Dusts and mists</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc Oxide</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>15000 mg/kg</td>
<td>N/A</td>
<td>Löser (1972)</td>
</tr>
<tr>
<td>Zinc Oxide</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>N/A</td>
<td>Löser (1977)</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability
Not rapidly degradable

12.3 Bioaccumulative potential
No evidence to indicate significant bioaccumulative potential

12.4 Mobility in soil
No evidence to indicate significant mobility in soil

12.5 Results of PBT and vPvB assessment
ZnO is not PBT or vPvB.

12.6 Other adverse effects
None

13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Generation of product waste should be minimized wherever possible. Disposal of product, solutions, and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional or local authority requirements. Dispose of surplus and non-recyclable products via licensed waste disposal contractor. Waste should not be released into sewer system unless regulations permit such release.

Containers/Packaging
Generation of packaging waste should be minimized wherever possible. Waste packaging should be recycled when possible. Incineration and/or landfill dumping should only be considered when recycling isn’t feasible. Make sure to follow all local, state, federal, and international regulations when disposing of packaging materials.

## 14 TRANSPORTATION INFORMATION

### 14.1 US Information

<table>
<thead>
<tr>
<th>NAFTA Tariff Class</th>
<th>2817.00.0000, Sched. B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country of Origin</td>
<td>U.S.A.</td>
</tr>
<tr>
<td>Responsible party</td>
<td>U.S. Zinc, Houston Texas USA</td>
</tr>
<tr>
<td>Classification code</td>
<td>M7 (Formerly: Item Number 12C)</td>
</tr>
<tr>
<td>Hazard identification/reconnaissance #</td>
<td>90</td>
</tr>
<tr>
<td>NMFC Class</td>
<td>55</td>
</tr>
<tr>
<td>USDOT Information</td>
<td>This material is not regulated for USA, Mexico or Canada ground shipments</td>
</tr>
</tbody>
</table>

### 14.2 EU Information

<table>
<thead>
<tr>
<th>UN Number</th>
<th>ADR/RID</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2.1</td>
<td>UN3077</td>
<td>UN3077</td>
<td>UN3077</td>
</tr>
<tr>
<td>14.2.2</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC OXIDE)</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC OXIDE), MARINE POLLUTANT (ZINC OXIDE)</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC OXIDE)</td>
</tr>
</tbody>
</table>

### 14.2.3 Transport hazard Class(es)

- 9
- 18
- 9

<table>
<thead>
<tr>
<th>Packing Group</th>
<th>UN</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2.4</td>
<td>III</td>
<td>III</td>
<td>III</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Hazards</th>
<th>UN</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2.5</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special precautions for users</th>
<th>UN</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2.6</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Additional Information: Tunnel code (E)

<table>
<thead>
<tr>
<th>IATA special precautions for users</th>
<th>UN</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>IATA- Passenger Aircraft: 400kg (packing group 956)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IATA- Passenger Aircraft: 30kg (packing group Y956)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IATA- Cargo Aircraft: 400kg (packing group 956)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IATA-S.P.: A97, A158, A179</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The EU diamond for Dangerous to the Environment has a red border. A copy of this document may not be in color resulting in the above border incorrectly being displayed in black.*
15 REGULATORY INFORMATION

15.1 EEA

This SDS complies with GHS-CLP, and EEA/EUI REACH, HCS 2012 and SDS rules.

15.2 TSCA Equivalent ‘inventory’ regulations

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>AICS</td>
<td>Yes</td>
</tr>
<tr>
<td>SWISS</td>
<td>Yes</td>
</tr>
<tr>
<td>PICCS</td>
<td>Yes</td>
</tr>
<tr>
<td>DSL</td>
<td>Yes</td>
</tr>
<tr>
<td>NDSL</td>
<td>No</td>
</tr>
<tr>
<td>ASIA-PAC</td>
<td>Yes</td>
</tr>
<tr>
<td>EINECS</td>
<td>Yes, on inventory</td>
</tr>
<tr>
<td>ELINCS</td>
<td>No, notification/reporting not required</td>
</tr>
</tbody>
</table>

15.3 U.S. Regulatory Information

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>USDOT</td>
<td>Not Transport regulated, 49CFR172</td>
</tr>
<tr>
<td>SARA 302</td>
<td>Yes, name listed (Zinc), RQ= None, TPQ= None</td>
</tr>
<tr>
<td>SARA 311/312</td>
<td>Yes, acute hazard, 29CFR1200</td>
</tr>
<tr>
<td>SARA 313</td>
<td>Yes, Zn &amp; Pb compounds</td>
</tr>
<tr>
<td>CA Prop. 65</td>
<td>Yes, Pb &amp; Cd</td>
</tr>
<tr>
<td>CAA 112, 61</td>
<td>No, not regulated, no HAP’s</td>
</tr>
<tr>
<td>HAP</td>
<td></td>
</tr>
<tr>
<td>FIFRA 152 et seq.</td>
<td>No (product is not subject to FIFRA)</td>
</tr>
<tr>
<td>CERCLA 102/103</td>
<td>Name List, RQ=None</td>
</tr>
<tr>
<td>NSF 60/61</td>
<td>Submitted NSF, UL</td>
</tr>
<tr>
<td>FCC</td>
<td>Listed</td>
</tr>
<tr>
<td>CONEG</td>
<td>Compliant</td>
</tr>
<tr>
<td>ODS/ODC 82</td>
<td>No</td>
</tr>
<tr>
<td>TSCA</td>
<td>Yes, on Inventory, Compliant with TSCA, Notification not required</td>
</tr>
<tr>
<td>RCRA 261</td>
<td>If governing spec is &gt;1000 ppm Pb or &gt;20 ppm Cd, product must be TCLP tested for Pb and Cd to determine if waste product is subject to RCRA</td>
</tr>
<tr>
<td>USFDA</td>
<td>Listed as GRAS at 21CFR182.8991</td>
</tr>
</tbody>
</table>

15.4 EU REACH Information

<table>
<thead>
<tr>
<th>Information</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Origin – REACH ID</td>
<td>01-2119463881-32-0075 (Tonnage &gt;1000 t/year)</td>
</tr>
<tr>
<td>P.R.C. Pre-Registration #</td>
<td>05-2114620034-66-0000</td>
</tr>
<tr>
<td>Brazil Pre-Registration #</td>
<td>05-2114626885-37-0000</td>
</tr>
</tbody>
</table>
16 OTHER INFORMATION

16.1 Safety Phrases S60 in additional languages:
(FR): Eliminer le produit et son recipient comme un déchet dangereux.
(IT): Questo material e il suo contenitore devono essere smaltiti come rifiuti pericolosi.
(DE): Dieses Produkt und sein Behälter sind als gefährlicher Abfall zu entsorgen.

16.2 Safety phrases S61 in additional languages:
(FR): Éviter le rejet dans l’environnement. Consulter les instructions specials/la fiche de donnees de securite.
(IT): Non disperdere nell’ambiente. Riferirsi alle istruzioni speciali/ scede informative in material di sicurezza.
(DE): Freisetzung in die Umwelt vermeiden. Besondere Anweisungen einholen/ Sicherheitsdatenblatt zu Rate ziehen.

16.3 Risk phrases R50/53 in additional languages
(FR): Tres toxique pour les organismes aquatiques, peut entrainer des effets nefastes a long terme pour l'environnement aquatique.
(DE) : Sehr giftig für Wasserorganismen, kann in Gewässern längerfristig schädliche Wirkungen haben.
(IT): Altamente tossico per gli organismi acquatici, può provocare a lungo termine effetti negativi per l’ambiente acquatico

16.4 Signal Word, H and P phrases in additional languages:
16.4.1 DE Deutsch (German).
ZINKOXID. Signalwort: Achtung.
H410: Sehr giftig für Wasserorganismen mit langfristiger Wirkung.
P273: Freisetzung in die Umwelt vermeiden.
P391: Verschüttete Mengen aufnehmen.
P501: Diesen Stoff und seine(n) Behälter entsprechend geltendem Recht der Problemabfallsentsorgung zuführen.

16.4.2 FR Français (French).
OXYDE DE ZINC. Mention d'avertissement: Attention.
H410: Très toxique pour les organismes aquatiques, entraîne des effets néfastes à long terme.
P273: Éviter le rejet dans l'environnement.
P391: Recueillir le produit répandu.
P501: Éliminer le contenu/recipient dans des déchets dangereux ou spéciaux conformément à la loi qui s’applique.

16.4.3 IT Italiano (Italian).
OSSIDO DI ZINCO. Avvertenza: Attenzione.
H410: Molto tossico per gli organismi acquatici con effetti di lunga durata.
P501: Smaltire il prodotto/recipiente in conformità alla normativa vigente sui rifiuti speciali e pericolosi.
16.4.4 NL Dutch, Flemish (Dutch).
ZINKOXIDE. Signaalwoord: Waarschuwing.
H410: Zeer giftig voor in het water levende organismen, met langdurige gevolgen.
P501: Verwijder inhoud/container als gevaarlijk of bijzonder afval in overeenstemming met de geldende wetgeving.

16.4.5 ES Espanõl (Spanish).
OXIDO DEL CINC. Palabra de advertencia: Atención.
H410: Muy tóxico para los organismos acuáticos, con efectos nocivos duraderos.
P273: Evitar su liberación al medio ambiente.
P391: Recoger el vertido.
P501: Disponga del contenido/envase como basura peligrosa o especial de acuerdo con la ley aplicable.

16.4.6 DA Danish, Dansk (Danish).
ZINK OXID. Signalord: Advarsel.
H410: Meget giftig med langvarige virkninger for vandlevende organismer.
P273: Undgå udledning til miljøet.
P391: Udslip opsamles.
P501: Indholdet/beholderen bortskaffes som farligt affald i overensstemmelse med gældende regler.

16.4.7 PL Polish, Polska (Polish).
TLENED CYNKU. Haslo ostrzegawcze: Uwaga.
H410: Dziala bardzo toksycznie na organizmy wodne, powodujac dlugotrwale skutki.
P273: Unikac uwolnienia do srodowiska.
P391: Zebrac wyciek. P501: Wyzucac pojemniki zawierajace toksyczne i niebezpieczne substancje zgodnie z instrukcja

16.5 HMIS Hazard Rating (Paint and Coating Industry)
16.5.1 Health
1 (Slight)

16.5.2 Flammability
0

16.5.3 Reactivity
0

16.5.4 Personal Protection
E (in bulk dust conditions gloves, mask, and goggles are recommended)

16.6 CMS Hazard Rating (GHS)
Zinc Oxide. Signal word: Warning.
H410: Very toxic to aquatic life with long lasting effects.
P273: Avoid release to the environment.
P391: Collect spillage.
P501: Dispose of contents/container as hazardous or special waste in accordance with applicable law.

16.7 Table: Identified uses for ZnO and corresponding Generic Exposure Scenarios (GES) as provided by studies conducted by the International Zinc Association (2016) Tables as listed:
Table 1. Generic exposure scenarios for zinc oxide

<table>
<thead>
<tr>
<th>Number</th>
<th>Sector</th>
<th>Uses</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Zinc oxide production</td>
<td>Manufacture Substance</td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>1</td>
<td>Formulation step</td>
<td>Formulation general</td>
<td>GES\text{ZnO} 1</td>
</tr>
<tr>
<td>2</td>
<td>First tier applications</td>
<td>Manufacturing of other zinc compounds</td>
<td>GES\text{ZnO} 2</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Laboratory reagent</td>
<td>GES\text{ZnO} 3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>As component for solid blends &amp; matrices</td>
<td>GES\text{ZnO} 4</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>As component for production of dispersions, pastes and other viscous matrices</td>
<td>GES\text{ZnO} 5</td>
</tr>
<tr>
<td>6</td>
<td>Second tier applications</td>
<td>DU of ZnO-containing solid preparations</td>
<td>GES\text{ZnO} 6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>DU of ZnO-containing liquid &amp; pasty preparations</td>
<td>GES\text{ZnO} 7</td>
</tr>
<tr>
<td>8</td>
<td>Generic wide dispersive use</td>
<td></td>
<td>GES\text{ZnO} 8</td>
</tr>
</tbody>
</table>

Table 128 is specific for nano- ZnO that is not present in US Zinc product.

Table 2. Identified uses for ZnO and corresponding Generic Exposure Scenario (GES)

<table>
<thead>
<tr>
<th>Identified Use (IU) name</th>
<th>Brief description of use process</th>
<th>GES code</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-1: Zinc oxide production-Direct</td>
<td></td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>M-2: Zinc oxide production-Indirect</td>
<td></td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>M-3: Zinc oxide production-Wet</td>
<td></td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>M-4: Zinc production nano</td>
<td></td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>M-5: Zinc air batteries by-product</td>
<td></td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>M-6: ZnO in electrotechnical contact material</td>
<td></td>
<td>GES\text{ZnO} 0</td>
</tr>
<tr>
<td>F-1: Laboratory reagent</td>
<td>Use of Zinc oxide as active laboratory reagent in aqueous or organic media, for analysis or synthesis</td>
<td>GES\text{ZnO} 3</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>F-2: Formulation dry mixture</td>
<td>Zinc Oxide is used in the formulation of dry preparations by mixing thoroughly the starting materials, with potentially pressing, pelletizing, sintering and packaging of the preparation.</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-3: Hand mixing of dry formulation</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations for formulations of dry mixtures by hand-mixing, with potentially pressing, pelletizing, sintering and packaging of the preparation.</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-4: Formulation in organic matrix</td>
<td>Zinc Oxide is used in the formulation of organic preparations or organic Zinc-substances by mixing the starting materials in a organic-based matrix, with potentially dispersing, pressing, injecting and packaging</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-5: Formulation as paste</td>
<td>Zinc oxide is used in the formulation of pastes by mixing thoroughly the starting materials, with liquids and packaging the preparation.</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-6: Formulations of water-based inorganic preparations</td>
<td>Zinc Oxide is used in the formulation of water-based preparations by mixing the starting materials in a water-based matrix, with potentially filtering and packaging</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-7: Nano ZnO use as laboratory reagent</td>
<td>Use of nano as lab reagent in various media for research, analysis or synthesis</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-8: Nano ZnO in dry formulation (powders)</td>
<td>Nano ZnO is used in formulations of dry preparations by mixing thoroughly the starting materials and further packaging.</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-9: Nano ZnO formulated in dispersions</td>
<td>Nano ZnO is used in the formulation of dispersions by mixing the starting materials in a water-based or organic matrix, with potentially filtering and packaging</td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>F-10: Industrial distribution</td>
<td></td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>F-11: Industrial USE to formulate fertilizers products mixtures</td>
<td></td>
<td>GESZnO 1</td>
</tr>
<tr>
<td>IW-1: Component for production of inorganic zinc compounds</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations in the manufacture of other inorganic Zinc-substances, through different process routes, with potentially drying, calcining and packaging</td>
<td>GESZnO 2</td>
</tr>
<tr>
<td>IW-2: Component for production of organic zinc compounds</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations in the manufacture of organic preparations or organic Zinc-substances by mixing the starting materials in a organic-based matrix, with potentially filtering or casting and packaging</td>
<td>GESZnO-2</td>
</tr>
<tr>
<td>IW-3: Component for production of Inorganic pigments</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations as component for the manufacture of inorganic pigments and others.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-4: Component for production of Coatings / paints, inks, enamels, varnishes</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations as component for the manufacture of paints and other coatings for i.e. metallic surfaces, wood products and others.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-5: Component for Paper coating</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations as component for coatings and treatment preparations for paper products</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-6: Additive / component for production of ceramics</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of ceramics</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-7: Additive / component for production of frits</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of frits with pressing, melting, rapid cooling</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-8: Additive for the production of friction agents in break pads</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of friction agents</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-9: Additive / component for production of glass</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of glass</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>IW-10: Surface treatment of flat glass</td>
<td>ZnO can occasionally be formed at the surface of flat glass by induced coatings reactions</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-11: Additive in the manufacturing of electronic components</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of electronic components and articles.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-12: Additive in the manufacturing of ferrites</td>
<td>Industrial use of ZnO or ZnO-formulations blending, pressing and sintering, for production of ferrites.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-13: Additive in the manufacturing of varistors</td>
<td>Industrial use of ZnO or ZnO-formulations for production of varistors.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-14: ZnO in electrotechnical contact material</td>
<td>ZnO can occur as induced component in electrotechnical contact material.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-15: Fuel cells - solar energy cells</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of fuel cells or solar energy cells.</td>
<td>GESZnO 4, GESZnO 5</td>
</tr>
<tr>
<td>IW-16: Component for production of rubber, resins and related preparations</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of rubber products</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-17: Component for polymer-matrices, plastics, thermoplastics and related preparations</td>
<td>Industrial use of ZnO or ZnO-formulations in manufacturing of polymer matrices and plastic products</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-18: Additive for the production of Sealants / Adhesives / Mastics</td>
<td>Industrial use of ZnO as additive in formulation of sealants and adhesives for metallic surfaces and wood products</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-19: Additive for the production of Lubricants / Grease / Metal working fluids and other fluids</td>
<td>Industrial use of ZnO as additive in formulation of lubricants and greases</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-20: Additive for the production of Polishes / wax blends</td>
<td>Industrial use of ZnO as additive in formulation of polishes and wax blends</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-21: Additive for production of de-icing products</td>
<td>Industrial use of ZnO for production of de-icing products</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>IW-22: Additive for the production of pyrotechnic products</td>
<td>Industrial use of ZnO for production of pyrotechnic products.</td>
<td>GESZnO 4</td>
</tr>
<tr>
<td>IW-23: Additive in the formulation of cosmetics</td>
<td>Industrial use of ZnO as an active component in the manufacturing of cosmetics preparations by mixing or blending of solid or liquid materials</td>
<td>GESZnO 4, GESZnO 5</td>
</tr>
<tr>
<td>IW-24: Component for Textile &amp; leather coating / treatment</td>
<td>Industrial use of Zinc Oxide or ZnO-formulations as component for coatings and treatment preparations for textile and leather products</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-25: additive in formulation of pharmaceutical or veterinary product</td>
<td>Industrial use of ZnO as an active component in the manufacturing of veterinary preparations by mixing or blending of solid or liquid materials</td>
<td>GESZnO 4, GESZnO 5</td>
</tr>
<tr>
<td>IW-26: Ancillary activity resulting in potential ZnO exposure: substrate preparation (sanding)</td>
<td>Sanding of surfaces between application of coatings</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>IW-27: Additive in the manufacturing of solder products (pastes)</td>
<td>Electrowinning uses an electrolytic cell to reduce the zinc. An electric current is run from a lead-silver anode through a zinc solution. The zinc deposits on an aluminum cathode and is harvested. The zinc is then melted and cast into ingots.</td>
<td>GESZnO 2</td>
</tr>
<tr>
<td>IW-28: Zinc production by pyrometallurgy (distillation)</td>
<td>Industrial use of impure or recycled ZnO in the manufacture of pure Zinc metal. The smelting process is carried out in a furnace and condensor, with occasional controlled exposure</td>
<td>GESZnO 2</td>
</tr>
<tr>
<td>IW-29: Use of ZnO-containing paints &amp; coatings</td>
<td>Industrial use of coatings and paints, thinners and paint removers containing ZnO.</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>IW-30: Use of ZnO containing paper coating</td>
<td>Industrial use of paper coatings containing ZnO.</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>IW-32: Use of ZnO containing textile &amp; leather coating</td>
<td>Industrial use of leather &amp; textile coatings containing ZnO.</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>IW-33: Use of ZnO containing glazes and glassy thin film coatings</td>
<td>Industrial use of ZnO-containing formulations in the glazing and other thin film coating process</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>IW-34: Use of ZnO in displays and LED</td>
<td></td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>IW-35: Use of ZnO thin films</td>
<td>Industrial use of ZnO-containing thin film coatings</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>IW-36: Use of ZnO containing catalysts</td>
<td>Industrial use of ZnO containing catalysts. Zinc oxide is a constituent of many types of catalysts: it is present for its catalytic activity, its ability to absorb catalyst poisons (a.o. S and Cl) and as catalyst strength component.</td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-37: Use of ZnO as adsorbants</td>
<td></td>
<td>GESZnO 5</td>
</tr>
<tr>
<td>IW-38: Use of ZnO as nutrition additive/feedstuff</td>
<td>Industrial use of ZnO or ZnO-formulations for the production of nutrition additives. Zinc oxide is used in mineral premixes as a source of the essential trace element zinc.</td>
<td>GESZnO 4, GESZnO 5</td>
</tr>
<tr>
<td>IW-39: Additive in biocidal products</td>
<td>Industrial use of ZnO for the production of biocidal products</td>
<td>GESZnO 4, GESZnO 5</td>
</tr>
<tr>
<td>IW-40: ZnO in soaps and detergents</td>
<td>Industrial use of ZnO for the production of cleaning products.</td>
<td>GESZnO 4, GESZnO 5</td>
</tr>
<tr>
<td>IW-41: ZnO as ingredient for dental cement</td>
<td>Industrial use of ZnO as an component in the manufacturing of dentistry dry matrices by mixing or blending of solid materials</td>
<td>GESZnO 2</td>
</tr>
<tr>
<td>IW-42: Nano ZnO (coated or uncoated) as UV filter in cosmetic emollients used for sunscreen, skin care and pharmaceuticals preparations</td>
<td>Industrial use of nano ZnO as an active component in the manufacturing of sunscreen, skin care and pharmaceutical preparations</td>
<td>GESZnOnano 4 - 5</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>mixing or blending of solid or liquid materials</td>
<td><strong>IW-43</strong>: Nano ZnO (coated or uncoated) as component for polymer-matrices, plastics, thermoplastics and related preparations</td>
<td>GESZnOnano 4</td>
</tr>
<tr>
<td>Industrial use of nano ZnO as an additive or active ingredient in the manufacturing of polymer-matrices, plastics, thermoplastics and related preparations by mixing or blending of solid or liquid materials</td>
<td><strong>IW-44</strong>: Nano ZnO (coated or uncoated) used as additive in the manufacturing of electronic components</td>
<td>GESZnOnano 5</td>
</tr>
<tr>
<td>Industrial use of nano ZnO as an additive in the manufacturing of electronic components</td>
<td><strong>IW-45</strong>: Nano ZnO (coated or uncoated) used as UV protectant in clear coatings</td>
<td>GESZnOnano 5</td>
</tr>
<tr>
<td><strong>IW-46</strong>: Nano ZnO (coated or uncoated) used as transparent UV absorber in food contact materials</td>
<td>GESZnOnano 5</td>
<td></td>
</tr>
<tr>
<td>Professional use of coatings and paints, thinners and paint removers containing ZnO.</td>
<td><strong>PW-1</strong>: Use of ZnO-containing paints &amp; coatings</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>Professional use of coatings and paints, thinners and paint removers containing ZnO.</td>
<td><strong>PW-2</strong>: Artists supply: Use of ZnO-containing paints &amp; coatings</td>
<td>GESZnO 8</td>
</tr>
<tr>
<td>Professional use of paper coatings containing ZnO.</td>
<td><strong>PW-3</strong>: Use of ZnO-containing paper coatings</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>Professional use of leather &amp; textile coatings containing ZnO</td>
<td><strong>PW-4</strong>: Use of ZnO-containing textile &amp; leather coatings</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>Professional use of ZnO-containing formulations in the glazing and other thin film coating process.</td>
<td><strong>PW-5</strong>: Use of ZnO-containing glazes and glassy thin film coatings</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>PW-6: Use of ZnO-containing friction agents: Brake pads</td>
<td>Professional use of ZnO-containing friction agents in brake pads</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>PW-7: Use of ZnO-containing glassy thin film coatings</td>
<td>Professional use of ZnO-containing thin film coatings</td>
<td>GESZnO 6</td>
</tr>
<tr>
<td>PW-8: Use of ZnO-containing rubber and other resins for medical devices and applications</td>
<td>Professional use of ZnO-containing rubber and other resins for medical devices and applications</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>PW-9: Use of ZnO-containing polymers for floor, wall coverings and similar preparations</td>
<td>Professional use of ZnO-containing polymers for wall &amp; floor coverings</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>PW-10: Use of ZnO-containing polymers for cable protecting &amp; isolating coatings</td>
<td>Professional use of ZnO-containing polymers for sheet and cable protecting &amp; isolating coatings</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>PW-11: Use of ZnO-containing polymers for tube &amp; sheet articles</td>
<td>Professional use of ZnO-containing polymers for tube &amp; sheet articles</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>PW-12: Use of ZnO-containing polymers for molded articles</td>
<td>Professional use of ZnO-containing polymers for molded articles</td>
<td>GESZnO 7</td>
</tr>
<tr>
<td>PW-13: Use of ZnO-containing plastic thin films coatings</td>
<td>Professional use of ZnO-containing thin film coatings</td>
<td>GESZnO 8</td>
</tr>
<tr>
<td>PW-14: Use of ZnO-containing Sealants / Adhesives / Mastics</td>
<td>Professional use of ZnO-containing sealants and adhesives for various types of substrates</td>
<td>GESZnO 8</td>
</tr>
<tr>
<td>PW-15: Use of ZnO-containing Lubricants / Grease / Metal working fluids</td>
<td>Professional use of ZnO-containing lubricants and greases</td>
<td>GESZnO 8</td>
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<td>PW-16: Use of ZnO-containing Polishes/ wax blends</td>
<td>Professional use of ZnO-containing polishes and wax blends</td>
<td>GESZnO 8</td>
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<tr>
<td>PW-17: Use of ZnO-containing de-icing products</td>
<td>Professional use of use of ZnO-containing de-icing products</td>
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<td>PW-18: Use of ZnO-containing pyrotechnic products</td>
<td>Professional use of ZnO-containing pyrotechnic products.</td>
<td>GESZnO 8</td>
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<tr>
<td>Identified Use (IU) name</td>
<td>Brief description of use process</td>
<td>GES code</td>
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<tr>
<td>PW-19: Use of cosmetics</td>
<td>Professional use of ZnO containing cosmetics preparations</td>
<td>GESZnO 8, Generic consumer exposure</td>
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<td>PW-20: Use of Pharma / veterinary products</td>
<td>Professional use of ZnO in pharmaceutical preparations</td>
<td>GESZnO 8, Generic consumer exposure</td>
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<tr>
<td>PW-21: use of ZnO containing biocidal products</td>
<td>Professional use of biocidal products</td>
<td>GESZnO 8, Generic consumer exposure</td>
</tr>
<tr>
<td>PW-22: Use of ZnO containing cleaning products</td>
<td>Professional use of various cleaning products/detergents (car, diswasher, floor, washing machine, ...) by automatic, semi-automatic or manual process (ref: AISE exposure scenarios)</td>
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</tr>
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<td>PW-23: Ancillary activity resulting in potential ZnO exposure: substrate preparation (sanding)</td>
<td>sanding of surfaces between application of coatings</td>
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<td>PW-24: Professional formulation of fertiliser products</td>
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<td>GESZnO - 6 &amp; GESZnO - 7</td>
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<td>PW-25: Professional USE as fertiliser in greenhouse</td>
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<td>PW-26: Professional use as liquid fertiliser in open field (fertigation)</td>
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<tr>
<td>PW-27: Professional use as fertiliser - maintenance of equipment</td>
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<tr>
<td>C-1: Artists supply: Use of ZnO-containing paints &amp; coatings</td>
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<td>GESZnO - 8 and consumer exposure</td>
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<tr>
<td>C-3: Use of ZnO-containing Sealants / Adhesives / Mastics</td>
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<tr>
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### Identified Use (IU) name

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<tr>
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<td>C-6: Use of ZnO-containing de- icing products</td>
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<td>C-7: Use of ZnO-containing pyrotechnic products</td>
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<td>C-9: Use of ZnO-containing fertilizer's formulations</td>
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<td>C-10: Use of cosmetics</td>
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<tr>
<td>C-12: Use of ZnO-containing antifouling paints</td>
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<td>GESZnO - 8 and consumer exposure</td>
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*Corresponds to “GES 8” in IUCLID

### 16.8 Preparation Date (see heading)

### 16.9 Other

This Safety Data Sheet (SDS) provides information on the safety requirements working with this material. This SDS is not a guarantee of the product’s properties. The information is believed to be accurate by the preparer utilizing reasonably available published data. We are not responsible for any inadvertent error or omission. End use of this product will include many factors beyond our control, and we cannot accept liability for any accident, injury, or damage caused by its use.