SAFETY DATA SHEET  
according to Regulation (EC) No. 1907/2006  

ZN-50  

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

1.1 Product identifier  
Trade name : ZN-50  

SDS-Identcode : 032G  

1.2 Relevant identified uses of the substance or mixture and uses advised against  
Use of the Substance/Mixture : Industrial use, Thread Compound (Pipe Dope) and Jacking grease for use in Offshore industries, Mining, (without offshore industries)  
Recommended restrictions on use : Do not use on oxygen lines or in oxygen enriched atmospheres.  

1.3 Details of the supplier of the safety data sheet  
Company : Bestolife Corporation INTERTEK FRANCE  
2126 Vanco Drive 27400 HEUDEBOUVILLE 75061, FRANCE Irving  
Telephone : 855-243-9164/972-865-8961 +33 385 991270  
Telefax : 214-631-3047 +33 385 991288  
E-mail address of person responsible for the SDS : www.bestolife.com/christian.gimenez@intertek.com/if.reach@intertek.com  

1.4 Emergency telephone number  
CHEMTREC: +(44)-870-8200418; Internntnl: +1-703-527-3887 NHS Drct: +44 0845 4647 (Medical only)  

SECTION 2: Hazards identification  

2.1 Classification of the substance or mixture  
Classification (REGULATION (EC) No 1272/2008)  
<table>
<thead>
<tr>
<th>Classification</th>
<th>Cat</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye irritation, Category 2</td>
<td></td>
<td>H319: Causes serious eye irritation.</td>
</tr>
<tr>
<td>Skin sensitisation, Category 1</td>
<td></td>
<td>H317: May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>Reproductive toxicity, Category 1A</td>
<td></td>
<td>H360D: May damage the unborn child.</td>
</tr>
<tr>
<td>Short-term (acute) aquatic hazard, Category 1</td>
<td></td>
<td>H400: Very toxic to aquatic life.</td>
</tr>
<tr>
<td>Long-term (chronic) aquatic hazard, Category 1</td>
<td></td>
<td>H410: Very toxic to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

2.2 Label elements  
Labelling (REGULATION (EC) No 1272/2008)
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

ZN-50

Hazard pictograms:

Signal word: Danger

Hazard statements:
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H360D May damage the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:
Prevention:
P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P391 Collect spillage.

Hazardous components which must be listed on the label:
Calcium bis(di C8-C10, branched, C9 rich, alkylanaphthalenesulphonate)
Calcium petroleum sulfonates
Lead

Additional Labelling
Restricted to professional users.

2.3 Other hazards
None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Components</th>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>231-175-3</td>
<td>Aquatic Acute 1; H400</td>
<td>&gt;= 50 - &lt; 70</td>
</tr>
<tr>
<td></td>
<td>030-001-01-9</td>
<td>01-2119467174-37</td>
<td>Aquatic Chronic 1; H410</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M-Factor (Acute aquatic toxicity): 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M-Factor (Chronic)</td>
<td></td>
</tr>
<tr>
<td>Substance</td>
<td>CAS Number</td>
<td>SDS Number</td>
<td>Aquatic Acute</td>
<td>Aquatic Chronic</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------</td>
<td>--------------</td>
<td>---------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Zinc oxide</td>
<td>1314-13-2</td>
<td>00017</td>
<td>Aquatic Acute 1; H400</td>
<td>Aquatic Chronic 1; H410</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>1305-78-8</td>
<td>116080-00017</td>
<td>Skin Irrit. 2; H315</td>
<td>Eye Dam. 1; H318</td>
</tr>
<tr>
<td>Calcium bis(di C8-C10, branched, C9 rich, alkylnaphthalenesulphonate)</td>
<td>Not Assigned</td>
<td></td>
<td>Skin Irrit. 2; H315</td>
<td>Eye Irrit. 2; H319</td>
</tr>
<tr>
<td>Calcium petroleum sulfonates</td>
<td>61789-86-4</td>
<td></td>
<td>Skin Sens. 1B; H317</td>
<td></td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td></td>
<td>Carc. 1A; H350i</td>
<td>STOT RE 1; H372</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td></td>
<td>Carc. 2; H351</td>
<td>Repr. 1A; H360FD</td>
</tr>
<tr>
<td>Cadmium</td>
<td>7440-43-9</td>
<td></td>
<td>Acute Tox. 4; H302</td>
<td>Acute Tox. 2; H330</td>
</tr>
<tr>
<td>Copper metal powder</td>
<td>7440-50-8</td>
<td></td>
<td>Flam. Sol. 1; H228</td>
<td>Aquatic Acute 1; H400</td>
</tr>
</tbody>
</table>
SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

If inhaled : If inhaled, remove to fresh air. Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

If swallowed : If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water.

4.2 Most important symptoms and effects, both acute and delayed

Risks : May cause an allergic skin reaction. Causes serious eye irritation. May damage the unborn child.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water spray Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting : Exposure to combustion products may be a hazard to health.
Hazardous combustion products : Carbon oxides
Metal oxides
Sulphur oxides

5.3 Advice for firefighters
Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Personal precautions : Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions
Environmental precautions : Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spills cannot be contained.

6.3 Methods and material for containment and cleaning up
Methods for cleaning up : Sweep up or vacuum up spillage and collect in suitable container for disposal. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.
6.4 Reference to other sections
See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Technical measures: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Advice on safe handling:
- Do not get on skin or clothing.
- Do not swallow.
- Do not get in eyes.
- Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
- Keep container tightly closed.
- Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures:
- If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers:
- Keep in properly labelled containers. Store locked up. Keep tightly closed. Store in accordance with the particular national regulations.

Advice on common storage:
- Do not store with the following product types:
  - Strong oxidizing agents
  - Organic peroxides
  - Explosives
  - Gases

7.3 Specific end use(s)
Specific use(s):
- No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc</td>
<td>14807-96-6</td>
<td>TWA (Respirable dust)</td>
<td>1 mg/m3</td>
<td>GB EH40</td>
</tr>
</tbody>
</table>

Further information: For the purposes of these limits, respirable dust and inhalable dust are those fractions of airborne dust which will be collected when sampling is undertaken in accordance with the methods described in MDHS14/4 General methods for sampling and gravimetric analysis or respirable, thoracic and inhalable aerosols, Talc is defined as the mineral talc together with other hydrous phyllosilicates including chlorite and carbonate ma-
terials which occur with it, but excluding amphibole asbestos and crystalline silica., The COSHH definition of a substance hazardous to health includes dust of any kind when present at a concentration in air equal to or greater than 10 mg.m-3 8-hour TWA of inhalable dust or 4 mg.m-3 8-hour TWA of respirable dust. This means that any dust will be subject to COSHH if people are exposed to dust above these levels. Some dusts have been assigned specific WELs and exposure to these must comply with the appropriate limits., Most industrial dusts contain particles of a wide range of sizes. The behaviour, deposition and fate of any particular particle after entry into the human respiratory system, and the body response that it elicits, depend on the nature and size of the particle. HSE distinguishes two size fractions for limit-setting purposes termed 'inhalable' and 'respirable',. Inhalable dust approximates to the fraction of airborne material that enters the nose and mouth during breathing and is therefore available for deposition in the respiratory tract. Respirable dust approximates to the fraction that penetrates to the gas exchange region of the lung. Fuller definitions and explanatory material are given in MDHS14/4., Where dusts contain components that have their own assigned WEL, all the relevant limits should be complied with., Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit should be used.

<table>
<thead>
<tr>
<th>Material</th>
<th>CAS Number</th>
<th>TWA (Inhalable fraction)</th>
<th>TWA (Respirable fraction)</th>
<th>STEL (Respirable fraction)</th>
<th>Further information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium oxide</td>
<td>1305-78-8</td>
<td>TWA 2 mg/m3</td>
<td>TWA 1 mg/m3</td>
<td>TWA 4 mg/m3</td>
<td>GB EH40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2017/164/EU</td>
<td></td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td>TWA 0.1 mg/m3 (Silica)</td>
<td>TWA 0.1 mg/m3</td>
<td>2004/37/EC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>TWA 0.15 mg/m3 (Lead)</td>
<td></td>
<td>98/24/EC I</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td>7440-43-9</td>
<td>TWA 0.025 mg/m3</td>
<td></td>
<td>2004/37/EC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper metal powder</td>
<td>7440-50-8</td>
<td>TWA 0.2 mg/m3 (Copper)</td>
<td>TWA 1 mg/m3 (Copper)</td>
<td>2004/37/EC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Quartz

### Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>Lead (Lead): 0.7 mg/l (Blood)</td>
<td>98/24/EC II</td>
<td></td>
</tr>
</tbody>
</table>

### Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>83 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>2.5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>83 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>0.83 mg/kg bw/day</td>
</tr>
<tr>
<td>Zinc oxide</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>10 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>83 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>2.5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>83 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>0.83 mg/kg bw/day</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>4 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1 mg/m³</td>
</tr>
<tr>
<td>Calcium bis(di C8-C10, branched, C9 rich, alkylnaphtalenesulphonate)</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>70 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>10 mg/kg bw/day</td>
</tr>
<tr>
<td>Calcium petroleum sulfonates</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>11.75 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>3.33 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term local effects</td>
<td>1.03 mg/cm²</td>
</tr>
</tbody>
</table>
### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>Fresh water</td>
<td>20.6 µg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>6.1 µg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>100 µg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>117.8 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>56.5 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>35.6 mg/kg</td>
</tr>
<tr>
<td>Zinc oxide</td>
<td>Fresh water</td>
<td>20.6 µg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>6.1 µg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>100 µg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>117.8 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>56.5 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>35.6 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>Fresh water</td>
<td>0.37 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.24 mg/l</td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>0.37 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>2.27 mg/l</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>817.4 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td>Calcium bis(di C8-C10,</td>
<td>Fresh water</td>
<td>4 µg/l</td>
</tr>
</tbody>
</table>
### Exposure controls

#### Engineering measures
Minimize workplace exposure concentrations.

#### Personal protective equipment

8.2 Exposure controls

<table>
<thead>
<tr>
<th>Substance</th>
<th>Freshwater - intermittent</th>
<th>Marine water</th>
<th>Sewage treatment plant</th>
<th>Fresh water sediment</th>
<th>Marine sediment</th>
<th>Soil</th>
<th>Oral (Secondary Poisoning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>branched, C9 rich, alkynaphthalenesulphonate</td>
<td>2.7 µg/l</td>
<td>0.4 µg/l</td>
<td>10 mg/l</td>
<td>69 mg/kg dry weight (d.w.)</td>
<td>6.9 mg/kg dry weight (d.w.)</td>
<td>13.9 mg/kg dry weight (d.w.)</td>
<td>22.2 mg/kg food</td>
</tr>
<tr>
<td>Calcium petroleum sulfonates</td>
<td>Fresh water</td>
<td>1 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>1 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>10 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>1000 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>226000000 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>226000000 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>271000000 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oral (Secondary Poisoning)</td>
<td>16.667 mg/kg food</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>Fresh water</td>
<td>6.5 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>3.4 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>100 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>174 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>164 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>147 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oral (Secondary Poisoning)</td>
<td>10.9 mg/kg food</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td>Fresh water</td>
<td>0.19 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>1.14 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>20 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>1.8 mg/kg dry weight (d.w.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>0.64 mg/kg dry weight (d.w.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>0.9 mg/kg dry weight (d.w.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oral (Secondary Poisoning)</td>
<td>0.16 mg/kg food</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper metal powder</td>
<td>Fresh water</td>
<td>7.8 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>5.2 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>230 µg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>87 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>676 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>65 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Eye protection

Wear the following personal protective equipment:
- Safety goggles
- Equipment should conform to BS EN 166

Hand protection

Material
- Chemical-resistant gloves

Remarks
- Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer.
- Wash hands before breaks and at the end of workday.

Skin and body protection

Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
- Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Respiratory protection

If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
- Equipment should conform to BS EN 14387
- Filter type: Combined particulates and organic vapour type (A-P)

SECTION 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>Viscous semi-solid</td>
</tr>
<tr>
<td>Colour</td>
<td>grey</td>
</tr>
<tr>
<td>Odour</td>
<td>Petroleum</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable (not an aqueous solution)</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>( \geq 252 ^\circ C )</td>
</tr>
<tr>
<td></td>
<td>Method: ASTM D 92, Cleveland open cup</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not classified as a flammability hazard</td>
</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower explosion limit / Lower flammability limit</td>
<td>No data available</td>
</tr>
</tbody>
</table>
**SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

**ZN-50**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
<th>Date of first issue:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>16.03.2020</td>
<td>116080-00017</td>
<td>01.10.2018</td>
<td>12.05.2015</td>
</tr>
</tbody>
</table>

- **Vapour pressure**: Not applicable
- **Relative vapour density**: Not applicable
- **Relative density**: 1.8
- **Solubility(ies)**
  - **Water solubility**: negligible
  - **Partition coefficient: n-octanol/water**: Not applicable
  - **Auto-ignition temperature**: No data available
  - **Decomposition temperature**: No data available
- **Viscosity**
  - **Viscosity, kinematic**: Not applicable
- **Flow time**: No data available
- **Explosive properties**: Not explosive
- **Oxidizing properties**: The substance or mixture is not classified as oxidizing.

**9.2 Other information**
- **Molecular weight**: No data available
- **Particle size**: No data available

**SECTION 10: Stability and reactivity**

**10.1 Reactivity**
Not classified as a reactivity hazard.

**10.2 Chemical stability**
Stable under normal conditions.

**10.3 Possibility of hazardous reactions**
- **Hazardous reactions**: Can react with strong oxidizing agents.

**10.4 Conditions to avoid**
- **Conditions to avoid**: None known.

**10.5 Incompatible materials**
- **Materials to avoid**: Oxidizing agents

**10.6 Hazardous decomposition products**
No hazardous decomposition products are known.
SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on likely routes of exposure:
- Skin contact
- Ingestion
- Eye contact

Acute toxicity:
Not classified based on available information.

Components:

**Zinc:**
- Acute oral toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 401
  Assessment: The substance or mixture has no acute oral toxicity
- Acute inhalation toxicity: LC50 (Rat): > 5.41 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: OECD Test Guideline 403
  Assessment: The substance or mixture has no acute inhalation toxicity

**Zinc oxide:**
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
- Acute inhalation toxicity: LC50 (Rat): > 5.7 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: OECD Test Guideline 403
  Assessment: The substance or mixture has no acute inhalation toxicity
- Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 402
  Assessment: The substance or mixture has no acute dermal toxicity

**Calcium oxide:**
- Acute oral toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 425
- Acute inhalation toxicity: (Rat): > 5 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: OECD Test Guideline 436
  Remarks: Based on data from similar materials
- Acute dermal toxicity: LD50 (Rabbit): > 2,500 mg/kg
  Method: OECD Test Guideline 402
  Assessment: The substance or mixture has no acute dermal toxicity
toxicity
Remarks: Based on data from similar materials

**Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):**

- **Acute oral toxicity:** LD50 (Rat): > 5,000 mg/kg
- **Acute dermal toxicity:** LD50 (Rabbit): > 5,000 mg/kg

**Calcium petroleum sulfonates:**

- **Acute oral toxicity:** LD50 (Rat): > 5,000 mg/kg
  Method: OECD Test Guideline 401
- **Acute inhalation toxicity:** LC50 (Rat): > 1.9 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Assessment: The substance or mixture has no acute inhalation toxicity
  Remarks: Based on data from similar materials
- **Acute dermal toxicity:** LD50 (Rabbit): > 4,000 mg/kg
  Assessment: The substance or mixture has no acute dermal toxicity

**Quartz:**

- **Acute oral toxicity:** LD50 (Rat): > 5,000 mg/kg

**Lead:**

- **Acute oral toxicity:** LD50 (Rat): > 2,000 mg/kg
  Remarks: Based on data from similar materials
- **Acute dermal toxicity:** LD50 (Rat): > 2,000 mg/kg
  Remarks: Based on data from similar materials

**Cadmium:**

- **Acute oral toxicity:** LD50 (Mouse): 890 mg/kg
- **Acute inhalation toxicity:** LC50 (Rat): 0.112 mg/l
  Exposure time: 2 h
  Test atmosphere: dust/mist

**Copper metal powder:**

- **Acute oral toxicity:** LD50 (Rat): > 2,500 mg/kg
  Method: OECD Test Guideline 423
  Assessment: The substance or mixture has no acute oral toxicity
- **Acute inhalation toxicity:** LC50 (Rat): > 5.11 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation
Not classified based on available information.

Components:

**Zinc oxide:**
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation

**Calcium oxide:**
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: Skin irritation
- Remarks: Based on data from similar materials

**Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):**
- Species: Rabbit
- Result: Skin irritation
- Remarks: Based on data from similar materials

**Calcium petroleum sulfonates:**
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation
- Remarks: Based on data from similar materials

**Lead:**
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation
- Remarks: Based on data from similar materials

**Copper metal powder:**
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation

Serious eye damage/eye irritation
- Causes serious eye irritation.
Components:

Zinc:
- Species: Rabbit
- Method: OECD Test Guideline 405
- Result: No eye irritation

Zinc oxide:
- Species: Rabbit
- Method: OECD Test Guideline 405
- Result: No eye irritation

Calcium oxide:
- Species: Rabbit
- Method: OECD Test Guideline 405
- Result: Irreversible effects on the eye

Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):
- Species: Rabbit
- Result: Irritation to eyes, reversing within 21 days
- Remarks: Based on data from similar materials

Calcium petroleum sulfonates:
- Species: Rabbit
- Method: OECD Test Guideline 405
- Result: No eye irritation
- Remarks: Based on data from similar materials

Lead:
- Species: Rabbit
- Method: OECD Test Guideline 405
- Result: No eye irritation
- Remarks: Based on data from similar materials

Copper metal powder:
- Species: Rabbit
- Method: OECD Test Guideline 405
- Result: No eye irritation

Respiratory or skin sensitisation

Skin sensitisation
- May cause an allergic skin reaction.

Respiratory sensitisation
- Not classified based on available information.
<table>
<thead>
<tr>
<th>Substance</th>
<th>Test Type</th>
<th>Exposure routes</th>
<th>Species</th>
<th>Method</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium oxide</td>
<td>Maximisation Test</td>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>OECD Test Guideline 406</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td>Calcium bis(di C8-C10, branched, C9 rich, alkylnaphthalenesulphonate)</td>
<td>Local lymph node assay (LLNA)</td>
<td>Skin contact</td>
<td>Mouse</td>
<td>OECD Test Guideline 429</td>
<td>negative</td>
<td>Based on data from similar materials</td>
</tr>
<tr>
<td>Calcium petroleum sulfonates</td>
<td>Buehler Test</td>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>positive</td>
<td>Based on data from similar materials</td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>Maximisation Test</td>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>OECD Test Guideline 406</td>
<td>negative</td>
<td>Based on data from similar materials</td>
</tr>
<tr>
<td>Copper metal powder</td>
<td>Maximisation Test</td>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>OECD Test Guideline 406</td>
<td>negative</td>
<td></td>
</tr>
</tbody>
</table>
Germ cell mutagenicity

Not classified based on available information.

Components:

Zinc:

Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: positive
Remarks: Based on data from similar materials

Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Germ cell mutagenicity - Assessment: Weight of evidence does not support classification as a germ cell mutagen.

Zinc oxide:

Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vitro: Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: equivocal

Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Result: equivocal

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 474
Result: negative

Genotoxicity in vivo: Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: positive

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
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Method: OECD Test Guideline 474
Result: negative

Germ cell mutagenicity- Assessment: Weight of evidence does not support classification as a germ cell mutagen.

**Calcium oxide:**

Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative
Remarks: Based on data from similar materials

**Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):**

Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

**Calcium petroleum sulfonates:**

Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Result: negative

**Lead:**

Genotoxicity in vitro: Test Type: In vitro sister chromatid exchange assay in mammalian cells
### Genotoxicity in vivo
- **Test Type:** Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
- **Species:** Rat
- **Application Route:** Ingestion
- **Result:** positive
- **Remarks:** Based on data from similar materials

### Cadmium:
#### Genotoxicity in vitro
- **Test Type:** In vitro sister chromatid exchange assay in mammalian cells
- **Result:** equivocal
- **Remarks:** Based on data from similar materials

#### Genotoxicity in vivo
- **Test Type:** Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
- **Species:** Mouse
- **Application Route:** Intraperitoneal injection
- **Result:** positive
- **Remarks:** Based on data from similar materials

- **Test Type:** Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
  - **Species:** Mouse
  - **Application Route:** Intraperitoneal injection
  - **Result:** positive
  - **Remarks:** Based on data from similar materials

- **Test Type:** Mammalian bone marrow sister chromatid exchange
  - **Species:** Mouse
  - **Application Route:** Intraperitoneal injection
  - **Result:** positive
  - **Remarks:** Based on data from similar materials

### Copper metal powder:
#### Genotoxicity in vitro
- **Test Type:** Bacterial reverse mutation assay (AMES)
  - **Method:** OECD Test Guideline 471
  - **Result:** negative

#### Genotoxicity in vivo
- **Test Type:** Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
  - **Species:** Mouse
  - **Application Route:** Ingestion
Carcinogenicity

Not classified based on available information.

**Product:**

Carcinogenicity - Assessment: Petroleum distillates have been classified as not carcinogenic based on DMSO extract content < 3% (Regulation (EC) 1272/2008, Annex VI, Part 3, Note L).

Weight of evidence does not support classification as a carcinogen

**Components:**

**Zinc oxide:**
Species: Mouse
Application Route: Ingestion
Exposure time: 1 Years
Result: negative
Remarks: Based on data from similar materials

**Calcium oxide:**
Species: Rat
Application Route: Ingestion
Exposure time: 104 weeks
Result: negative
Remarks: Based on data from similar materials

**Quartz:**
Species: Humans
Application Route: Inhagination (dust/mist/fume)
Result: positive
Remarks: These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Carcinogenicity - Assessment: Positive evidence from human epidemiological studies (inhilation)

**Lead:**
Species: Rat
Application Route: Ingestion
Exposure time: 2 Years
Result: positive
Remarks: Based on data from similar materials

Carcinogenicity - Assessment: Limited evidence of carcinogenicity in animal studies
Cadmium:

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Ingestion</td>
</tr>
<tr>
<td>Exposure time</td>
<td>77 - 102 weeks</td>
</tr>
<tr>
<td>Result</td>
<td>positive</td>
</tr>
<tr>
<td>Remarks</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>inhalation (dust/mist/fume)</td>
</tr>
<tr>
<td>Exposure time</td>
<td>18 Months</td>
</tr>
<tr>
<td>Result</td>
<td>positive</td>
</tr>
<tr>
<td>Remarks</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

Carcinogenicity - Assessment: Sufficient evidence of carcinogenicity in animal experiments

Reproductive toxicity

May damage the unborn child.

Components:

Zinc oxide:

<table>
<thead>
<tr>
<th>Effects on fertility</th>
<th>Test Type: Two-generation reproduction toxicity study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species: Rat</td>
<td>Application Route: Ingestion</td>
</tr>
<tr>
<td>Result: negative</td>
<td>Remarks: Based on data from similar materials</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effects on foetal development</th>
<th>Test Type: Embryo-foetal development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species: Rat</td>
<td>Application Route: inhalation (dust/mist/fume)</td>
</tr>
<tr>
<td>Method: OECD Test Guideline 414</td>
<td>Result: negative</td>
</tr>
<tr>
<td>Remarks: Based on data from similar materials</td>
<td></td>
</tr>
</tbody>
</table>

Calcium oxide:

<table>
<thead>
<tr>
<th>Effects on fertility</th>
<th>Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species: Rat</td>
<td>Application Route: Ingestion</td>
</tr>
<tr>
<td>Method: OECD Test Guideline 422</td>
<td>Result: negative</td>
</tr>
<tr>
<td>Remarks: Based on data from similar materials</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effects on foetal development</th>
<th>Test Type: Embryo-foetal development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species: Mouse</td>
<td>Application Route: Ingestion</td>
</tr>
<tr>
<td>Method: OECD Test Guideline 414</td>
<td>Result: negative</td>
</tr>
</tbody>
</table>

Calcium bis(di C8-C10, branched, C9 rich, alkylnapthalenesulphonate):

<table>
<thead>
<tr>
<th>Effects on fertility</th>
<th>Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test</th>
</tr>
</thead>
</table>
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: Based on data from similar materials

**Effects on foetal development**  
: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: Based on data from similar materials

**Calcium petroleum sulfonates:**  

**Effects on fertility**  
: Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: negative  
Remarks: Based on data from similar materials

**Lead:**  

**Effects on fertility**  
: Test Type: Two-generation reproduction toxicity study  
Species: Mouse  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

**Effects on foetal development**  
: Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

**Reproductive toxicity - Assessment**  
: Positive evidence of adverse effects on sexual function and fertility from human epidemiological studies., Positive evidence of adverse effects on development from human epidemiological studies., Studies indicating a hazard to babies during the lactation period

**Cadmium:**  

**Effects on fertility**  
: Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: inhalation (dust/mist/fume)  
Result: positive  
Remarks: Based on data from similar materials

**Effects on foetal development**  
: Test Type: Embryo-foetal development  
Species: Rat  
Application Route: inhalation (dust/mist/fume)  
Method: OECD Test Guideline 414
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Result: positive
Remarks: Based on data from similar materials

Test Type: Embryo-foetal development
Species: Mouse
Application Route: inhalation (dust/mist/fume)
Method: OECD Test Guideline 414
Result: positive
Remarks: Based on data from similar materials

Reproductive toxicity - Assessment:
Some evidence of adverse effects on sexual function and fertility, based on animal experiments. Some evidence of adverse effects on development, based on animal experiments.

Copper metal powder:

Effects on fertility:
Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development:
Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Ingestion
Result: negative

STOT - single exposure
Not classified based on available information.

Components:

Calcium oxide:
Assessment: May cause respiratory irritation.

STOT - repeated exposure
Not classified based on available information.

Components:

Zinc oxide:
Assessment: No significant health effects observed in animals at concentrations of 0.2 mg/l/6h/d or less.

Quartz:
Exposure routes: inhalation (dust/mist/fume)
Target Organs: Lungs
Assessment: Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.
Lead:
Target Organs: Kidney, Central nervous system, Blood
Assessment: Causes damage to organs through prolonged or repeated exposure.

Cadmium:
Exposure routes: Ingestion
Target Organs: Bone
Assessment: Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Exposure routes: inhalation (dust/mist/fume)
Target Organs: Kidney, Lungs
Assessment: Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Repeated dose toxicity

Components:

Zinc:
Species: Rat
NOAEL: 31 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

Zinc oxide:
Species: Rat, male
NOAEL: 0.0015 mg/l
Application Route: inhalation (dust/mist/fume)
Exposure time: 3 Months
Method: OECD Test Guideline 413

Calcium oxide:
Species: Rat
NOAEL: >= 0.399 mg/l
Application Route: inhalation (dust/mist/fume)
Exposure time: 90 Days
Method: OECD Test Guideline 413

Calcium bis(di C8-C10, branched, C9 rich, alkylnaphthalenesulphonate):
Species: Rat
NOAEL: 100 mg/kg
LOAEL: 300 mg/kg
Application Route: Ingestion
Exposure time: 90 Days
Method: OECD Test Guideline 408

Calcium petroleum sulfonates:
Species: Rat
Application Route: Skin contact
Exposure time: 28 Days
Method: OECD Test Guideline 410
Remarks: Based on data from similar materials

Quartz:
Species: Humans
LOAEL: 0.053 mg/m³
Application Route: Inhalation (dust/mist/fume)
Remarks: These substance(s) are inextricably bound in the product and therefore do not contribute to a dust inhalation hazard.

Lead:
Species: Rat
NOAEL: 0.0015 mg/kg
LOAEL: 0.005 mg/kg
Application Route: Ingestion
Exposure time: 6 - 12 Months
Remarks: Based on data from similar materials

Cadmium:
Species: Rat
NOAEL: 0.2 mg/kg
LOAEL: 0.5 mg/kg
Application Route: Ingestion
Exposure time: 12 Months
Remarks: Based on data from similar materials

Copper metal powder:
Species: Rat
NOAEL: >= 2 mg/m³
Application Route: Inhalation (dust/mist/fume)
Exposure time: 28 Days

Aspiration toxicity
Not classified based on available information.
SECTION 12: Ecological information

12.1 Toxicity

Components:

**Zinc:**
- To fish: LC50 (Pimephales promelas (fathead minnow)): 0.78 mg/l
  - Exposure time: 96 h
- To daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 1.83 mg/l
  - Exposure time: 48 h
  - Method: OECD Test Guideline 202
- To algae/aquatic plants: IC50 (Pseudokirchneriella subcapitata (green algae)): 0.15 mg/l
  - Exposure time: 72 h
  - Method: OECD Test Guideline 201
- M-Factor (Acute aquatic toxicity): 1
- To microorganisms: EC50: 5.2 mg/l
  - Exposure time: 3 h
  - Method: OECD Test Guideline 209
- To fish (Chronic toxicity): NOEC: 0.199 mg/l
  - Exposure time: 30 d
  - Species: Oncorhynchus mykiss (rainbow trout)
- To daphnia and other aquatic invertebrates (Chronic toxicity): NOEC: 0.1 mg/l
  - Exposure time: 21 d
  - Species: Daphnia magna (Water flea)
- M-Factor (Chronic aquatic toxicity): 1

**Zinc oxide:**
- To fish: LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.1 - 1 mg/l
  - Exposure time: 96 h
  - Remarks: Based on data from similar materials
- To daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 0.01 - 0.1 mg/l
  - Exposure time: 48 h
  - Remarks: Based on data from similar materials
- To algae/aquatic plants: EC50 (Selenastrum capricornutum (green algae)): > 0.1 - 1 mg/l
  - Exposure time: 96 h
  - Remarks: Based on data from similar materials
  - NOEC (Selenastrum capricornutum (green algae)): > 0.001 - 0.01 mg/l
  - Exposure time: 72 h
Remarks: Based on data from similar materials

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC: > 0.01 - 0.1 mg/l
Species: Oncorhynchus mykiss (rainbow trout)
Exposure time: 25 d
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: > 0.01 - 0.1 mg/l
Species: Daphnia magna (Water flea)
Exposure time: 21 d
Remarks: Based on data from similar materials

M-Factor (Chronic aquatic toxicity) : 10

**Calcium oxide:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

EC10 (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50: > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: > 1 mg/l
Exposure time: 14 d
Species: Crangon crangon (shrimp)
Remarks: Based on data from similar materials

**Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):**

Toxicity to fish : LL50 (Cyprinus carpio (Carp)): > 100 mg/l
Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates:

EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:

EL50 (Pseudokirchneriella subcapitata (green algae)): > 10 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to microorganisms:

NOEC: > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):

NOELR: 2.2 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 211

Calcium petroleum sulfonates:

Toxicity to fish:

LL50 (Cyprinodon variegatus (sheepshead minnow)): > 10,000 mg/l
Exposure time: 96 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates:

EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:

EC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Remarks: Based on data from similar materials

Toxicity to microorganisms:

EC50: > 10,000 mg/l
### Quartz:

**Ecotoxicology Assessment**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute aquatic toxicity</td>
<td>No toxicity at the limit of solubility</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
<td>No toxicity at the limit of solubility</td>
</tr>
</tbody>
</table>

### Lead:

**Toxicity to fish**

<table>
<thead>
<tr>
<th>Species</th>
<th>LC50 (Oncorhynchus mykiss (rainbow trout))</th>
<th>Exposure time: 96 h</th>
</tr>
</thead>
</table>

**Toxicity to daphnia and other aquatic invertebrates**

<table>
<thead>
<tr>
<th>Species</th>
<th>EC50 (Ceriodaphnia dubia (water flea))</th>
<th>Exposure time: 48 h</th>
</tr>
</thead>
</table>

**Toxicity to algae/aquatic plants**

<table>
<thead>
<tr>
<th>Species</th>
<th>ErC50 (Pseudokirchneriella subcapitata (green algae))</th>
<th>Exposure time: 72 h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EC10 (Pseudokirchneriella subcapitata (green algae))</td>
<td>6.1 µg/l</td>
</tr>
</tbody>
</table>

**M-Factor (Acute aquatic toxicity)**

| M-Factor                                    | 10 |

**Toxicity to fish (Chronic toxicity)**

| Species                             | EC10: 20 µg/l | Exposure time: 30 d |

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

| Species                             | EC10: 1.7 µg/l | Exposure time: 7 d |

**M-Factor (Chronic aquatic toxicity)**

| M-Factor                                    | 10 |

### Cadmium:

**Toxicity to fish**

| Species                             | LC50 (Carassius auratus (goldfish)): > 0.1 - 1 mg/l | Exposure time: 96 h |

**Toxicity to daphnia and other aquatic invertebrates**

| Species                             | EC50 (Daphnia magna (Water flea)): 36 µg/l | Exposure time: 48 h |

**Toxicity to algae/aquatic plants**

| Species                             | ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0.01 - 0.1 mg/l | Exposure time: 72 h |

**Method:** OECD Test Guideline 209

**Remarks:** Based on data from similar materials
NOEC (Pseudokirchneriella subcapitata (green algae)): 2.4 µg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity):
NOEC: > 0.001 - 0.01 mg/l
Exposure time: 36 Months
Species: Salvelinus fontinalis (Brook trout)
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
EC10: > 0.001 - 0.01 mg/l
Exposure time: 28 d
Species: Mysidopsis bahia (opossum shrimp)
Remarks: Based on data from similar materials

Copper metal powder:
Toxicity to fish:
LC50: > 10 - 100 µg/l
Exposure time: 96 h

Toxicity to fish (Chronic toxicity):
NOEC: > 1 - 10 µg/l

M-Factor (Chronic aquatic toxicity): 10

12.2 Persistence and degradability

Components:

Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):
Biodegradability: Result: Not readily biodegradable.
Remarks: Based on data from similar materials

Calcium petroleum sulfonates:
Biodegradability: Result: Not readily biodegradable.
Biodegradation: 8.6 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

12.3 Bioaccumulative potential

Components:

Zinc:
Bioaccumulation: Species: Fish
Bioconcentration factor (BCF): 177
Zinc oxide:

- Bioaccumulation: Species: Oncorhynchus mykiss (rainbow trout)
  - Bioconcentration factor (BCF): 78 - 2,060

Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):

- Partition coefficient: n-octanol/water: log Pow: > 6.6

Calcium petroleum sulfonates:

- Partition coefficient: n-octanol/water: log Pow: > 6.65

Cadmium:

- Partition coefficient: n-octanol/water: log Pow: -0.07
  - Remarks: Calculation

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Not relevant

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

- Product: Dispose of in accordance with local regulations.
  - According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.
  - Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

- Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
  - Empty containers retain residue and can be dangerous.
  - Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death.
  - If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

- ADN: UN 3077
- ADR: UN 3077
- RID: UN 3077
- IMDG: UN 3077
14.2 UN proper shipping name

**ADN**: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Zinc oxide)

**ADR**: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Zinc oxide)

**RID**: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Zinc oxide)

**IMDG**: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Zinc oxide)

**IATA**: Environmentally hazardous substance, solid, n.o.s. (Zinc, Zinc oxide)

14.3 Transport hazard class(es)

**ADN**: 9

**ADR**: 9

**RID**: 9

**IMDG**: 9

**IATA**: 9

14.4 Packing group

**ADN**
- Packing group: III
- Classification Code: M7
- Hazard Identification Number: 90
- Labels: 9 (ENVIRONM.)

**ADR**
- Packing group: III
- Classification Code: M7
- Hazard Identification Number: 90
- Labels: 9 (ENVIRONM.)
- Tunnel restriction code: (-)

**RID**
- Packing group: III
- Classification Code: M7
- Hazard Identification Number: 90
- Labels: 9 (ENVIRONM.)

**IMDG**
- Packing group: III
- Labels: 9 (ENVIRONM.)
- EmS Code: F-A, S-F
14.5 Environmental hazards

**ADN**
Environmentally hazardous: yes

**ADR**
Environmentally hazardous: yes

**RID**
Environmentally hazardous: yes

**IMDG**
Marine pollutant: yes

**IATA (Passenger)**
Environmentally hazardous: yes

**IATA (Cargo)**
Environmentally hazardous: yes

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Remarks: Not applicable for product as supplied.

SECTION 15: Regulatory information

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

**REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)**
Conditions of restriction for the following entries should be considered:
- Lead (Number on list 72, 30)
- Cadmium (Number on list 72, 28)

**REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).**
Lead

**REACH - List of substances subject to authorisation (Annex XIV)**
Not applicable

**Regulation (EC) No 1005/2009 on substances that de-**
Not applicable
SAFETY DATA SHEET
generated according to Regulation (EC) No. 1907/2006

ZN-50

Version 7.0 Revision Date: 16.03.2020 SDS Number: 116080-00017 Date of last issue: 01.10.2018

Date of first issue: 12.05.2015

Complete the ozone layer
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals

Other regulations:
Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

The components of this product are reported in the following inventories:

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL</td>
<td>All components of this product are on the Canadian DSL</td>
</tr>
<tr>
<td>TSCA</td>
<td>All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.</td>
</tr>
<tr>
<td>AICS</td>
<td>All ingredients listed or exempt.</td>
</tr>
</tbody>
</table>

15.2 Chemical safety assessment
A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Other information: Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

<table>
<thead>
<tr>
<th>H-Statement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H228</td>
<td>Flammable solid.</td>
</tr>
<tr>
<td>H302</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H317</td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
<tr>
<td>H341</td>
<td>Suspected of causing genetic defects.</td>
</tr>
<tr>
<td>H350</td>
<td>May cause cancer.</td>
</tr>
<tr>
<td>H350i</td>
<td>May cause cancer by inhalation.</td>
</tr>
<tr>
<td>H351</td>
<td>Suspected of causing cancer.</td>
</tr>
<tr>
<td>H360FD</td>
<td>May damage fertility. May damage the unborn child.</td>
</tr>
<tr>
<td>H361fd</td>
<td>Suspected of damaging fertility. Suspected of damaging the unborn child.</td>
</tr>
</tbody>
</table>
H362: May cause harm to breast-fed children.
H372: Causes damage to organs through prolonged or repeated exposure.
H372: Causes damage to organs through prolonged or repeated exposure if inhaled.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Full text of other abbreviations
Acute Tox. : Acute toxicity
Aquatic Acute : Short-term (acute) aquatic hazard
Aquatic Chronic : Long-term (chronic) aquatic hazard
Carc. : Carcinogenicity
Eye Dam. : Serious eye damage
Eye Irrit. : Eye irritation
Flam. Sol. : Flammable solids
Lact. : Effects on or via lactation
Muta. : Germ cell mutagenicity
Repr. : Reproductive toxicity
Skin Irrit. : Skin irritation
Skin Sens. : Skin sensitisation
STOT RE : Specific target organ toxicity - repeated exposure
STOT SE : Specific target organ toxicity - single exposure
2004/37/EC : Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
98/24/EC II : Chemical Agents Directive - Annex II: Binding biological limit values
GB EH40 : UK. EH40 WEL - Workplace Exposure Limits
2004/37/EC / TWA : Long term exposure limit
2017/164/EU / STEL : Short term exposure limit
2017/164/EU / TWA : Limit Value - eight hours
98/24/EC I / TWA : Occupational Exposure Limit Value
GB EH40 / TWA : Long-term exposure limit (8-hour TWA reference period)
GB EH40 / STEL : Short-term exposure limit (15-minute reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equip-
Further information


Classification of the mixture:

<table>
<thead>
<tr>
<th>Property</th>
<th>Classification</th>
<th>Classification procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2</td>
<td>H319</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Skin Sens. 1</td>
<td>H317</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Repr. 1A</td>
<td>H360D</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Acute 1</td>
<td>H400</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Chronic 1</td>
<td>H410</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.

GB / EN