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

1.1 Product identifier
   Trade name : 2000® ARCTIC GRADE

   SDS-Identcode : 310G

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; Interntnl: +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)
   Eye irritation, Category 2 H319: Causes serious eye irritation.
   Skin sensitisation, Category 1 H317: May cause an allergic skin reaction.

2.2 Label elements

   Labelling (REGULATION (EC) No 1272/2008)
   Hazard pictograms :
   Signal word : Warning
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

2000® ARCTIC GRADEx

Hazard statements: H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.

Precautionary statements: Prevention:
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.

Response:
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.

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

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>EC-No.</th>
<th>Index-No.</th>
<th>Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Copper metal powder</td>
<td>7440-50-8</td>
<td>231-159-6</td>
<td>01-2119480154-42</td>
<td>Flam. Sol. 1; H228 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 10 M-Factor (Chronic aquatic toxicity): 10</td>
<td>&gt;= 2.5 - &lt; 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calcium oxide</td>
<td>1305-78-8</td>
<td>215-138-9</td>
<td>01-2119475325-36</td>
<td>Skin Irrit. 2; H315 Eye Dam. 1; H318 STOT SE 3; H335</td>
<td>&gt;= 1 - &lt; 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calcium bis(di C8-C10, branched, C9 rich, alkylnaphthalenesulphonate)</td>
<td>Not Assigned</td>
<td>01-2119989085-16</td>
<td></td>
<td>Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1B; H317</td>
<td>&gt;= 1 - &lt; 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quartz</td>
<td>14808-60-7</td>
<td>238-878-4</td>
<td></td>
<td>Carc. 1A; H350i STOT RE 1; H372 (Lungs)</td>
<td>&gt;= 1 - &lt; 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antimony, dialkyl dithiocarbamate</td>
<td>15890-25-2</td>
<td></td>
<td></td>
<td>Acute Tox. 4; H302</td>
<td>&gt;= 0.25 - &lt; 1</td>
<td></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 if symptoms occur.

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 if symptoms occur. 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.

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
- Fluorine compounds
- 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 (see section 7) and personal protective equipment recommendations (see section 8).

6.2 Environmental precautions

Environmental precautions:
- Avoid release to the environment.
- Prevent further leakage or spillage if safe to do so.
- Retain and dispose of contaminated wash water.
- Local authorities should be advised if significant spillages 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 dis-
posal 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: For outdoor use only
Do not get on skin or clothing.
Avoid breathing dust, fume, gas, mist, vapours or spray.
Do not swallow.
Do not get in eyes.
Wash skin thoroughly after handling.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.
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. Contaminated work clothing should not be allowed out of the workplace. 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 in accordance with the particular national regulations.

Advice on common storage: Do not store with the following product types: Strong oxidizing agents

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>Graphite</td>
<td>7782-42-5</td>
<td>TWA (inhalable dust)</td>
<td>10 mg/m3</td>
<td>GB EH40</td>
</tr>
</tbody>
</table>
### TWA (Respirable dust)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc</td>
<td>4 mg/m³</td>
<td>GB EH40</td>
</tr>
<tr>
<td>Copper metal powder</td>
<td>0.2 mg/m³ (Copper)</td>
<td>GB EH40</td>
</tr>
<tr>
<td>Calcium oxide</td>
<td>2 mg/m³</td>
<td>GB EH40</td>
</tr>
<tr>
<td>Quartz</td>
<td>0.1 mg/m³</td>
<td>2004/37/EC</td>
</tr>
</tbody>
</table>

### TWA (Dusts and mists)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc</td>
<td>1 mg/m³</td>
<td>GB EH40</td>
</tr>
<tr>
<td>STEL (Dusts and mists)</td>
<td>2 mg/m³ (Copper)</td>
<td>GB EH40</td>
</tr>
</tbody>
</table>

### STEL (Respirable fraction)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium oxide</td>
<td>4 mg/m³</td>
<td>2017/164/EU</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 materials 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/m³ 8-hour TWA of inhalable dust or 4 mg/m³ 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.

Further information:
- Indicative STEL (Respirable fraction) 4 mg/m³ 2017/164/EU
- Capable of causing cancer and/or heritable genetic dam-
### 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>Graphite</td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>0.3 mg/m³</td>
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<tr>
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<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>813 mg/kg bw/day</td>
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<tr>
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</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1.2 mg/m³</td>
</tr>
<tr>
<td>Copper metal powder</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Acute systemic effects</td>
<td>20 mg/m³</td>
</tr>
<tr>
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</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>137 mg/kg bw/day</td>
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<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Acute systemic effects</td>
<td>237 mg/kg bw/day</td>
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<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Acute systemic effects</td>
<td>20 mg/m³</td>
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</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1 mg/m³</td>
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</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>137 mg/kg bw/day</td>
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<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Acute systemic effects</td>
<td>273 mg/kg bw/day</td>
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<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term local effects</td>
<td>0.172 mg/cm²</td>
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<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term local effects</td>
<td>0.086 mg/cm²</td>
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<tr>
<td></td>
<td>Calcium oxide</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1 mg/m³</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Acute local effects</td>
<td>4 mg/m³</td>
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<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1 mg/m³</td>
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<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Acute local effects</td>
<td>4 mg/m³</td>
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<td>Calcium bis(di C8-C10, branched, C9 rich, alkynaphtha-</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>70 mg/m³</td>
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<tr>
<td></td>
<td>lenesulphonate)</td>
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<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>10 mg/kg bw/day</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>Distillates (petroleum), hy-</td>
<td>Oral (Secondary Poisoning)</td>
<td>9.33 mg/kg food</td>
</tr>
</tbody>
</table>
drotreated light naphthenic

<table>
<thead>
<tr>
<th>Substance</th>
<th>Fresh water</th>
<th>Marine water</th>
<th>Sewage treatment plant</th>
<th>Fresh water sediment</th>
<th>Marine sediment</th>
<th>Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper metal powder</td>
<td>7.8 µg/l</td>
<td>5.2 µg/l</td>
<td>230 µg/l</td>
<td>87 mg/kg</td>
<td>676 mg/kg</td>
<td>65 mg/kg</td>
</tr>
<tr>
<td>Calcium(2+) 12-hydroxyoctadecanoate</td>
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<tr>
<td>Calcium oxide</td>
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</tbody>
</table>

8.2 Exposure controls

Engineering measures
Minimize workplace exposure concentrations.

Personal protective equipment

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.
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

Appearance: Viscous semi-solid
Colour: black, copper
Odour: Petroleum
Odour Threshold: No data available
pH: Not applicable (not an aqueous solution)
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: $\geq 162.8 \, ^\circ\text{C}$
Method: ASTM D 92, Cleveland open cup Distillates (petroleum), hydrotreated heavy naphthenic
Evaporation rate: Not applicable
Flammability (solid, gas): Not classified as a flammability hazard
Upper explosion limit / Upper flammability limit: No data available
Lower explosion limit / Lower flammability limit: No data available
Vapour pressure: Not applicable
Relative vapour density: Not applicable
Relative density: 1.3
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:
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
Method: OECD Test Guideline 436
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
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

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

Antimony, dialkyl dithiocarbamate:
Acute oral toxicity : Acute toxicity estimate: 2,000 mg/kg
Method: Expert judgement
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI
LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Expert judgement
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI
Acute dermal toxicity: LD50 (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation: Not classified based on available information.

Components:

Copper metal powder:
- 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, alkylnaphthalenesulphonate):
- Species: Rabbit
- Result: Skin irritation
- Remarks: Based on data from similar materials

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

Components:

Copper metal powder:
- 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, alkylnaphthalenesulphonate):
- Species: Rabbit
- Result: Irritation to eyes, reversing within 21 days
- Remarks: Based on data from similar materials

Respiratory or skin sensitisation

Skin sensitisation:
- May cause an allergic skin reaction.

Respiratory sensitisation:
- Not classified based on available information.
Components:

**Copper metal powder:**
- **Test Type:** Maximisation Test
- **Exposure routes:** Skin contact
- **Species:** Guinea pig
- **Method:** OECD Test Guideline 406
- **Result:** negative

**Calcium oxide:**
- **Test Type:** Local lymph node assay (LLNA)
- **Exposure routes:** Skin contact
- **Species:** Mouse
- **Method:** OECD Test Guideline 429
- **Result:** negative
- **Remarks:** Based on data from similar materials

**Calcium bis(di C8-C10, branched, C9 rich, alkylnaphthalenesulphonate):**
- **Test Type:** Buehler Test
- **Exposure routes:** Skin contact
- **Species:** Guinea pig
- **Result:** positive
- **Remarks:** Based on data from similar materials

**Assessment:** Probability or evidence of low to moderate skin sensitisation rate in humans

Germ cell mutagenicity
- Not classified based on available information.

Components:

**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
  - **Result:** negative
  - **Remarks:** Based on data from similar materials

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

**Calcium oxide:**
- **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, alkylnaphthalenesulphonate):  
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

Antimony, dialkyl dithiocarbamate:  
Genotoxicity in vitro  
Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

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

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).

Components:  
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: inhalation (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 (inhalation)

Reproductive toxicity
Not classified based on available information.

Components:

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

Calcium oxide:
Effects on fertility: 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

Effects on foetal development: Test Type: Embryo-foetal development
Species: Mouse
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative

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

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

Antimony, dialkyl dithiocarbamate:

Effects on fertility: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Result: negative

Effects on foetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
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:
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.

Repeated dose toxicity

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

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.

Antimony, dialkyl dithiocarbamate:

Species: Rat
NOAEL: >= 1,000 mg/kg
Application Route: Ingestion
Exposure time: 54 Days

Aspiration toxicity
Not classified based on available information.

SECTION 12: Ecological information

12.1 Toxicity

Product:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 1,064,120 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)): 15,470 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

EC50 (Daphnia magna (Water flea)): 30,940 mg/l
Exposure time: 48 h
Toxicity to algae/aquatic plants:

- EC50 (Selenastrum capricornutum (green algae)): 11,267 mg/l
  Exposure time: 96 h
  Method: OECD Test Guideline 201
  Remarks: Based on data from similar materials

- NOEC (Selenastrum capricornutum (green algae)): 100 mg/l
  Exposure time: 96 h
  Method: OECD Test Guideline 201
  Remarks: Based on data from similar materials

Components:

Copper metal powder:

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

- M-Factor (Acute aquatic toxicity):
  10

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

- 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

#### Toxicty to daphnia and other aquatic invertebrates (Chronic toxicity)

<table>
<thead>
<tr>
<th>Test Substance</th>
<th>NOEC</th>
<th>Exposure time</th>
<th>Species</th>
<th>Method</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate)</td>
<td>&gt; 1 mg/l</td>
<td>14 d</td>
<td>Crangon crangon (shrimp)</td>
<td>OECD Test Guideline 203</td>
<td>Based on data from similar materials</td>
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</table>

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

<table>
<thead>
<tr>
<th>Test Substance</th>
<th>EL50</th>
<th>Exposure time</th>
<th>Test Substance</th>
<th>Method</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test substance: Water Accommodated Fraction</td>
<td>&gt; 100 mg/l</td>
<td>96 h</td>
<td>LL50 (Cyprinus carpio (Carp))</td>
<td>OECD Test Guideline 203</td>
<td>Based on data from similar materials</td>
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</table>

<table>
<thead>
<tr>
<th>Test Substance</th>
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<tr>
<td>Test substance: Water Accommodated Fraction</td>
<td>&gt; 100 mg/l</td>
<td>48 h</td>
<td>EL50 (Daphnia magna (Water flea))</td>
<td>OECD Test Guideline 202</td>
<td>Based on data from similar materials</td>
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</table>

<table>
<thead>
<tr>
<th>Test Substance</th>
<th>EL50</th>
<th>Exposure time</th>
<th>Test Substance</th>
<th>Method</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test substance: Water Accommodated Fraction</td>
<td>&gt; 10 mg/l</td>
<td>72 h</td>
<td>EL50 (Pseudokirchneriella subcapitata (green algae))</td>
<td>OECD Test Guideline 201</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Substance</th>
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<tr>
<td>Test substance: Water Accommodated Fraction</td>
<td>&gt; 1 mg/l</td>
<td>72 h</td>
<td>EL10 (Pseudokirchneriella subcapitata (green algae))</td>
<td>OECD Test Guideline 201</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

#### Toxicity to microorganisms

<table>
<thead>
<tr>
<th>Test Substance</th>
<th>NOEC</th>
<th>Exposure time</th>
<th>Method</th>
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</thead>
<tbody>
<tr>
<td>Test substance: Water Accommodated Fraction</td>
<td>&gt; 100 mg/l</td>
<td>3 h</td>
<td>OECD Test Guideline 209</td>
<td>Based on data from similar materials</td>
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</table>

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

<table>
<thead>
<tr>
<th>Test Substance</th>
<th>NOELR</th>
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<tr>
<td>Test substance: Water Accommodated Fraction</td>
<td>2.2 mg/l</td>
<td>21 d</td>
<td>Daphnia magna (Water flea)</td>
<td>OECD Test Guideline 211</td>
<td>Based on data from similar materials</td>
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</table>

### Quartz:

#### Ecotoxicology Assessment

<table>
<thead>
<tr>
<th>Ecotoxicology Type</th>
<th>Toxicity</th>
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<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>
Antimony, dialkyl dithiocarbamate:
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
  - NOEC: 0.02 mg/l
  - Exposure time: 21 d
  - Species: Daphnia magna (Water flea)
  - Method: OECD Test Guideline 211
- M-Factor (Chronic aquatic toxicity): 1

Ecotoxicology Assessment
- Chronic aquatic toxicity: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

12.2 Persistence and degradability

**Product:**
- Biodegradability: Result: Readily biodegradable.
- Remarks: Based on data from similar materials

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

- Antimony, dialkyl dithiocarbamate:
  - Biodegradability: Result: Not readily biodegradable.
  - Biodegradation: 20 %
  - Exposure time: 28 d

12.3 Bioaccumulative potential

**Components:**
- Calcium bis(di C8-C10, branched, C9 rich, alkynaphthalenesulphonate):
  - Partition coefficient: n-octanol/water: log Pow: > 6.6

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

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<th>RID</th>
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14.2 UN proper shipping name

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<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper metal powder, Antimony, dialkyl dithiocarbamate)</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper metal powder, Antimony, dialkyl dithiocarbamate)</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper metal powder, Antimony, dialkyl dithiocarbamate)</td>
<td>Environmentally hazardous substance, solid, n.o.s. (Copper metal powder, Antimony, dialkyl dithiocarbamate)</td>
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14.3 Transport hazard class(es)

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14.4 Packing group

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</table>
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

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

2000® ARCTIC GRADE

Version
Revision Date: 8.0 09.11.2020
SDS Number: 117209-00018
Date of last issue: 02.11.2020
Date of first issue: 12.05.2015

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): Not applicable
- REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59): Not applicable
- REACH - List of substances subject to authorisation (Annex XIV): Not applicable
- Regulation (EC) No 1005/2009 on substances that deplete the ozone layer: Not applicable
- Regulation (EU) 2019/1021 on persistent organic pollutants (recast): Not applicable
- Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals: Not applicable

Other regulations:
- 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:

- DSL: All components of this product are on the Canadian DSL
- TSCA: All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.
- AICS: All ingredients listed or exempt.

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
H228: Flammable solid.
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

2000® ARCTIC GRADE

<table>
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<tr>
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<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
<th>Date of first issue:</th>
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<td>8.0</td>
<td>09.11.2020</td>
<td>117209-00018</td>
<td>02.11.2020</td>
<td>12.05.2015</td>
</tr>
</tbody>
</table>

H302 : Harmful if swallowed.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye irritation.
H332 : Harmful if inhaled.
H335 : May cause respiratory irritation.
H350i: May cause cancer by inhalation.
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
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
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
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; AIC - Australian Inventory of Industrial Chemicals; 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 Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a
test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:  
<table>
<thead>
<tr>
<th></th>
<th></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>
</tbody>
</table>

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

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