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

1.1. Product identifier
Trade name/designation: Copper Powder
Chemical name: copper
EC No: 231-159-6
CAS No.: 7440-50-8
REACH registration No.: 01-2119480154-42-XXXX
Product code: 9000-13000-FT-A33000

1.2. Relevant identified uses of the substance or mixture and uses advised against
Main use category: Industrial uses, Professional use.

1.3. Details of the supplier of the safety data sheet
Company: AVL METAL POWDERS n.v.
Elleboogstraat 7
B-8500 Kortrijk, Belgium, Europe
Telephone: +32 (0)56 22 00 21
Telefax: +32 (0)56 22 64 14
E-mail: sales@avlmetalpowders.com
Website: www.avlmetalpowders.com
VAT: BE 0405 375 371 - RPR Kortrijk

1.4. Emergency telephone number
Emergency telephone: +32 (0)475 38 36 83 (This telephone number is available 24 hours per day, 7 days per week.)

IRELAND (REPUBLIC OF)
National Poisons Information Centre
Beaumont Hospital
+353 18 37 99 64/353 1 809 21 66

UNITED KINGDOM
National Poisons Information Service
(Newcastle Centre)
Regional Drugs and Therapeutics Centre,
Wolfson Unit
0844 892 0111 (UK only, Monday to Friday, 08.00 to 18.00 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
2.1.1. Classification according to Regulation (EU) 1272/2008
CLP-Classification: The product is classified as hazardous in accordance with Regulation (EC) No. 1272/2008.
Flam. Sol. 1 H228
Acute Tox. 4 (Oral) H302
Aquatic Acute 1 H400
Aquatic Chronic 2 H411

Full text of H-phrases: see section 16

2.1.2. Classification according to EU Directives 67/548/EEC or 1999/45/EC
Classification: This substance is classified as hazardous according to 67/548/EEC.
F: R11
Xn; R22
N; R50
R53

Full text of R-phrases: see section 16

2.2. Label elements

2.2.1. Labelling according to Regulation (EU) 1272/2008

Hazard pictograms: 

- GHS02
- GHS07
- GHS09

Signal word: Danger

Hazard statements:
- H228 - Flammable solid.
- H302 - Harmful if swallowed.
- H400 - Very toxic to aquatic life.
- H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements:
- P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P273 - Avoid release to the environment.
- P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER/doctor/.
- P330 - Rinse mouth.
- P370+P378 - In case of fire: Use Dry sand, Special powder against metal fire for extinction.

2.2.2. Labelling according to Directives (67/548 - 1999/45)

Not relevant

2.3. Other hazards

Other hazards:
- This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
- This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Directive 67/548/EEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>copper</td>
<td>(CAS No.) 7440-50-8 (EC No) 231-159-6 (REACH no) 01-2119480154-42-XXXX</td>
<td>100</td>
<td>Xn; R22 N; R50 F; R11 R53</td>
</tr>
</tbody>
</table>

3.2. Mixtures

Not applicable
SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation: Provide fresh air. Put victim at rest, cover with a blanket and keep warm. Artificial respiration and/or oxygen may be necessary. If symptoms persist, call a physician.

Skin contact: Wash with plenty of water. Take off contaminated clothing.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

In case of ingestion: Rinse mouth thoroughly with water. Rinse mouth immediately and drink plenty of water. Do NOT induce vomiting. Get medical advice/attention.

Additional advice: First aider: Pay attention to self-protection! See also section 8. Treat symptomatically. When in doubt or if symptoms are observed, get medical advice.

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

Inhalation: Dyspnoea, The following symptoms may occur: Cough, sore throat, Headache, Harmful if inhaled.

Skin contact: Prolonged skin contact may cause skin irritation. Symptoms: erythema (redness).

Eye contact: Dust contact with the eyes can lead to mechanical irritation.

Ingestion: Harmful if swallowed. Abdominal pain, The following symptoms may occur: Nausea, Vomiting.

Other adverse effects: none.

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

No data available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Dry sand ABC-powder Co-ordinate fire-fighting measures to the fire surroundings.

Extinguishing media which must not be used for safety reasons: Water

5.2. Special hazards arising from the substance or mixture

Fire hazard: Flammable solid

Specific hazards: Do not allow run-off from fire-fighting to enter drains or water courses. Dispose according to legislation.

5.3. Advice for firefighters

Advice for firefighters: Special protective equipment for firefighters. In case of fire: Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: Evacuate area. Prevent unauthorised persons entering the zone.
Provide adequate ventilation.
Use personal protective equipment as required.
Personal protection equipment: see section 8
Avoid generation of dust.
Do not breathe dust.
Keep away from sources of ignition. - No smoking.
Use only non-sparking tools.

For emergency responders

- Ensure procedures and training for emergency decontamination and disposal are in place.
- Personal protection equipment: see section 8.

6.2. Environmental precautions

Environmental precautions

- Do not allow to enter into surface water or drains.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up

- Stop leak if safe to do so.
- Dam up.
- Take up mechanically.
- Do not rinse down with water.
- Dispose according to legislation.

6.4. Reference to other sections

Personal protection equipment: see section 8
Disposal: see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling

-Provide adequate ventilation.
-Use personal protective equipment as required.
-Avoid contact with skin, eyes and clothes.
-Do not breathe dust.
-Keep away from sources of ignition. - No smoking.
-Ensure that the equipment is adequately grounded.
-Use only non-sparking tools.
-Avoid generation of dust.
-Take any precaution to avoid mixing with incompatible materials.
-See also section 10
-Do not allow to enter into surface water or drains.

Advices on general occupational hygiene

- Keep good industrial hygiene.
- When using do not eat, drink or smoke.
- Wash hands before breaks and immediately after using the product.
- Take off contaminated clothing.

7.2. Conditions for safe storage, including any incompatibilities

Storage

-Keep containers tightly closed in a dry, cool and well-ventilated place.
-Do not store near or with any of the incompatible materials listed in section 10.

Packaging materials

-Keep/Store only in original container.

7.3. Specific end use(s)

No data available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limit values
<table>
<thead>
<tr>
<th>Country</th>
<th>Regulation Type</th>
<th>Limit Value (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>MAK</td>
<td>1 mg/m³ (inhalable fraction)</td>
</tr>
<tr>
<td>Austria</td>
<td>MAK Short time value (mg/m³)</td>
<td>0,1 mg/m³ (respirable fraction, smoke)</td>
</tr>
<tr>
<td>Belgium</td>
<td>Limit value (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>OEL TWA (mg/m³)</td>
<td>0,1 mg/m³ (metal vapor)</td>
</tr>
<tr>
<td>Croatia</td>
<td>GVI (granična vrijednost izloženosti) (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Croatia</td>
<td>KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m³)</td>
<td>1 mg/m³ (dust)</td>
</tr>
<tr>
<td>Spain</td>
<td>VLA-ED (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>VLE (mg/m³)</td>
<td>0,2 mg/m³ (inhalable)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>VME (mg/m³)</td>
<td>0,1 mg/m³ (inhalable)</td>
</tr>
<tr>
<td>Finland</td>
<td>HTP-arvo (8h) (mg/m³)</td>
<td>1 mg/m³ (dust and fumes)</td>
</tr>
<tr>
<td>Hungary</td>
<td>AK-érték</td>
<td>1 mg/m³ (fume)</td>
</tr>
<tr>
<td>Hungary</td>
<td>CK-érték</td>
<td>0,1 mg/m³ (inhalable)</td>
</tr>
<tr>
<td>Ireland</td>
<td>OEL (8 hours ref) (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Ireland</td>
<td>OEL (15 min ref) (mg/m³)</td>
<td>1 mg/m³ (dust and fumes)</td>
</tr>
<tr>
<td>Lithuania</td>
<td>IPRV (mg/m³)</td>
<td>0,6 mg/m³ (calculated-fume)</td>
</tr>
<tr>
<td>Norway</td>
<td>Gjennomsnittsverdier (AN) (mg/m³)</td>
<td>1 mg/m³ (inhalable fraction)</td>
</tr>
<tr>
<td>Norway</td>
<td>Gjennomsnittsverdier (Korttidsverdi) (mg/m³)</td>
<td>0,2 mg/m³ (respirable fraction)</td>
</tr>
<tr>
<td>Poland</td>
<td>NDS (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Croatia</td>
<td>GVI</td>
<td>0,2 mg/m³ (metal vapor)</td>
</tr>
<tr>
<td>Greece</td>
<td>OEL TWA (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Greece</td>
<td>OEL STEL (mg/m³)</td>
<td>2 mg/m³ (dust)</td>
</tr>
<tr>
<td>Italy - Portugal - USA</td>
<td>ACGIH TWA (mg/m³)</td>
<td>0,2 mg/m³ (fume)</td>
</tr>
</tbody>
</table>
**Copper Powder (7440-50-8)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Exposure limit (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romania</td>
<td>OEL STEL (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>0.20 mg/m³ (fume)</td>
</tr>
<tr>
<td></td>
<td>1.50 mg/m³ (dust)</td>
</tr>
<tr>
<td>Slovakia</td>
<td>NPHV (priemerná) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>1.0 mg/m³ (dust)</td>
</tr>
<tr>
<td></td>
<td>0.1 mg/m³ (fume)</td>
</tr>
<tr>
<td>Slovakia</td>
<td>NPHV (Hraničná) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>2.0 mg/m³ (dust)</td>
</tr>
<tr>
<td></td>
<td>0.2 mg/m³ (fume)</td>
</tr>
<tr>
<td>Sweden</td>
<td>nivágránsvärde (NVG) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td>1.0 mg/m³ (total dust)</td>
</tr>
<tr>
<td></td>
<td>0.2 mg/m³ (respirable dust)</td>
</tr>
</tbody>
</table>

**Recommended monitoring procedures**
- Concentration measurement in air
- Personal air monitoring

**8.2. Exposure controls**

- **Personal protection equipment**: The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
- **Hand protection**: Wear gloves in accordance with EN 388 as a protection against mechanical risks. Leather gloves. The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves.
- **Eye protection**: Dust protection eye glasses (EN 166).
- **Body protection**: Wear suitable protective clothing.
- **Thermal hazard protection**: Not required under normal use. Use dedicated equipment.
Engineering control measures: Use only in area provided with appropriate exhaust ventilation. Organisational measures to prevent/limit releases, dispersion and exposure. See also section 7.

Environmental exposure controls: Do not allow to enter into surface water or drains. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance: Powder
Colour: Copper
Odour: odourless
Odour threshold: No data available
Odour threshold: No data available
pH: Not applicable
Melting point/freezing point: 1083 °C
Initial boiling point and boiling range: 2597 °C
Flash point: Not applicable
Evaporation rate: No data available
Flammability (solid, gas): Flammable., (UN Test N.1: Test method for readily combustible solids)
Upper/lower flammability or explosive limits: No data available
Vapour pressure: Not applicable
Vapour density: No data available
Density: 8,96 g/cm³
Relative density: No data available
Water solubility: Insoluble
Solubility in different media: No data available
Partition coefficient n-octanol/water: No data available
Auto-ignition temperature: Not applicable
Decomposition temperature: No data available
Viscosity: Not applicable
Explosive properties: The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.

Oxidising properties: Not applicable
The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.

9.2. Other information

Other information: (Apparent) Density: 0,5 - 1, 3 g/cm³ @ 20°C

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity: Flammable solid.
Reference to other sections: 10.5
10.2. Chemical stability
Stability : The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions : Risk of dust explosion.
Reference to other sections: 10.4/10.5

10.4. Conditions to avoid
Conditions to avoid : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
See also section 7

10.5. Incompatible materials
Incompatible materials : No data available

10.6. Hazardous decomposition products
Hazardous decomposition products : none

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity : Oral: Harmful if swallowed.

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met.)
ph: Not applicable

Serious eye damage/eye irritation : Not classified (Based on available data, the classification criteria are not met.)
ph: Not applicable

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met.)

Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met.)

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

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

STOT-single exposure : Not classified (Based on available data, the classification criteria are not met.)

STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met.)

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

Other information
Symptoms related to the physical, chemical and toxicological characteristics. Reference to other sections: 4.2

SECTION 12: Ecological information

12.1. Toxicity
Toxicity : Very toxic to aquatic organisms.

copper (7440-50-8)

<table>
<thead>
<tr>
<th>Test</th>
<th>EC50</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>0.0068 - 0.0156 mg/l</td>
<td>(Exposure time: 96 h - Species: Pimephales promelas)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>0.03 mg/l</td>
<td>(Exposure time: 48 h - Species: Daphnia magna [Static])</td>
</tr>
<tr>
<td>EC50 other aquatic organisms 1</td>
<td>0.0426 - 0.0535 mg/l</td>
<td>(72 h - Pseudokirchneriella subcapitata)</td>
</tr>
</tbody>
</table>
copper (7440-50-8)

LC50 fish 2 < 0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 other aquatic organisms 2 0.031 - 0.054 mg/l (96 h - Pseudokirchneriella subcapitata)
EC50 72h algae [mg/l] (1) 0.0426 - 0.0535 mg/l (Species: Pseudokirchneriella subcapitata [static])
EC50 96h algae [mg/l] (1) 0.031 - 0.054 mg/l (Species: Pseudokirchneriella subcapitata [static])

12.2. Persistence and degradability
Persistence and degradability: Not biodegradable
not persistent.

12.3. Bioaccumulative potential
Bioaccumulation: No data available
Partition coefficient n-octanol/water: No data available

12.4. Mobility in soil
Mobility: No data available

12.5. Results of PBT and vPvB assessment
PBT/vPvB data: This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects
Other information:

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Product waste: Do not dispose of together with household waste.
If recycling is not practicable, dispose of in compliance with local regulations.
Contaminated packaging: Delivery to an approved waste disposal company.
Further ecological information: Do not allow to enter into surface water or drains.
List of proposed waste codes/waste designations in accordance with EWC: Classified as hazardous waste according to European Union regulations. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.
The following Waste Codes are only suggestions: 12 01 04

SECTION 14: Transport information

14.1. UN number
UN number: 3089

14.2. UN proper shipping name
Proper Shipping Name: METAL POWDER, FLAMMABLE, N.O.S. (Coated Copper Flakes (i))
Proper shipping name IATA/IMDG: METAL POWDER, FLAMMABLE, N.O.S. (Coated Copper Flakes (i))

14.3. Transport hazard class(es)
ADR/RID: tunnel restriction code E
Class(es): 4.1 - Flammable solids, self-reactive substances and solid desensitized explosives
Hazard identification number (Kemler No.): 40
Classification code: F3
14.3.2. Inland waterway transport (ADN)
Class (UN) : 4.1

14.3.3. Transport by sea
Class or Division : 4.1 - Flammable solids, self-reactive substances and solid desensitized explosives

14.3.4. Air transport
Class or Division : 4.1 - Flammable solids, self-reactive substances and solid desensitized explosives

14.4. Packing group
Packing group : II

14.5. Environmental hazards
Environmental hazards : N

Other information : Not applicable.

14.6. Special precautions for user
Special precautions for user : Not applicable.

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

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

40. Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.

This product contains an ingredient according to the candidate list of Annex XIV of the REACH Regulation 1907/2006/EC.

Authorisations : none

15.1.2. National regulations
15.2. Chemical safety assessment

Chemical Safety Assessment: For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

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

Acute Tox. 4 (Oral): Acute toxicity Category 4
Aquatic Acute 1: Hazardous to the aquatic environment - Aquatic Acute 1
Aquatic Chronic 2: Hazardous to the aquatic environment - chronic hazard category 2
Flam. Sol. 1: Flammable solids, Hazard Category 1
H228: Flammable solid.
H302: Harmful if swallowed.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.
R11: Highly flammable.
R22: Harmful if swallowed.
R50: Very toxic to aquatic organisms.
R53: May cause long-term adverse effects in the aquatic environment.
F: Highly flammable
N: Dangerous for the environment
Xn: Harmful

Key literature references and sources: European Metal Particulate Association (EMPA)

Abbreviations and acronyms:

ADN = Accord Européen relatif au Transport International des Marchandises par voie de Navigation du Rhin
ADR = Accord européen relatif au transport international des marchandises par Route
CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC
IATA = International Air Transport Association
IMDG = International Maritime Dangerous Goods Code
LEL = Lower Explosive Limit/Lower Explosion Limit
UEL = Upper Explosive Limit/Upper Explosive Limit
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
TWA = time weighted average
STEL = Short term exposure limit
PBT = persistent, bioaccumulating and toxic (PBT)
vPvB = very persistent and very bioaccumulating
EWC = European Waste Catalogue
NA = Not applicable
LC50 = Median lethal concentration
LD 50 = Median lethal dose
DNEL = Derived No Effect Level
PNEC = Predicted No Effect Concentration
NOAEL = No observed adverse effect level

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