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## 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)

0844 892 0111 (UK only, Monday to Friday, 08.00 to 18.00 hours)

Regional Drugs and Therapeutics Centre,

Wolfson Unit

## 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

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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.  
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.

Precautionary statements :

### 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


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

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
copper	(CAS No.) 7440-50-8 (EC No) 231-159-6 (REACH-no) 01-2119480154-42-XXXX	100	Flam. Sol. 1, H228 Acute Tox. 4 (Oral), H302 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 2, H411

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

### 3.2. Mixtures

Not applicable

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## 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.
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## 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.
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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.  
 Personal protection equipment: see section 8  
 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 :

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<b>copper (7440-50-8)</b>		
Austria	MAK (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (inhalable fraction) 0,1 mg/m <sup>3</sup> (respirable fraction, smoke)
Austria	MAK Short time value (mg/m <sup>3</sup> )	4 mg/m <sup>3</sup> (inhalable fraction) 0,4 mg/m <sup>3</sup> (respirable fraction, smoke)
Belgium	Limit value (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
Bulgaria	OEL TWA (mg/m <sup>3</sup> )	0,1 mg/m <sup>3</sup> (metal vapor)
Croatia	GVI (granična vrijednost izloženosti) (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust)
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (dust and fumes)
France	VLE (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (dust)
France	VME (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust)
Greece	OEL TWA (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust)
Greece	OEL STEL (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (dust)
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume)
Latvia	OEL TWA (mg/m <sup>3</sup> )	0,5 mg/m <sup>3</sup>
Spain	VLA-ED (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
Switzerland	VLE (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (inhalable)
Switzerland	VME (mg/m <sup>3</sup> )	0,1 mg/m <sup>3</sup> (inhalable)
Netherlands	Grenswaarde TGG 8H (mg/m <sup>3</sup> )	0,1 mg/m <sup>3</sup> (inhalable fraction)
United Kingdom	WEL TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust and mists) 0,2 mg/m <sup>3</sup> (fume)
United Kingdom	WEL STEL (mg/m <sup>3</sup> )	0,6 mg/m <sup>3</sup> (calculated-fume) 2 mg/m <sup>3</sup> (dust and mist)
Czech Republic	Expoziční limity (PEL) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust) 0,1 mg/m <sup>3</sup> (fume)
Denmark	Grænseværdie (langvarig) (mg/m <sup>3</sup> )	1,0 mg/m <sup>3</sup> (dust and powder) 0,1 mg/m <sup>3</sup> (fume)
Finland	HTP-arvo (8h) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> 0,1 mg/m <sup>3</sup> (respirable dust and fume)
Hungary	AK-érték	1 mg/m <sup>3</sup> 0,1 mg/m <sup>3</sup> (fume)
Hungary	CK-érték	4 mg/m <sup>3</sup> 0,4 mg/m <sup>3</sup> (fume)
Ireland	OEL (8 hours ref) (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust and mist)
Ireland	OEL (15 min ref) (mg/m <sup>3</sup> )	0,6 mg/m <sup>3</sup> (calculated-fume) 2 mg/m <sup>3</sup> (dust and mist)
Lithuania	IPRV (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (inhalable fraction) 0,2 mg/m <sup>3</sup> (respirable fraction)
Norway	Gjennomsnittsverdier (AN) (mg/m <sup>3</sup> )	0,1 mg/m <sup>3</sup> (fume) 1 mg/m <sup>3</sup> (dust)
Norway	Gjennomsnittsverdier (Kortidsverdi) (mg/m <sup>3</sup> )	0,3 mg/m <sup>3</sup> (fume) 3 mg/m <sup>3</sup> (dust)
Poland	NDS (mg/m <sup>3</sup> )	0,2 mg/m <sup>3</sup>
Romania	OEL TWA (mg/m <sup>3</sup> )	0,50 mg/m <sup>3</sup> (powder)

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<b>copper (7440-50-8)</b>		
Romania	OEL STEL (mg/m <sup>3</sup> )	0,20 mg/m <sup>3</sup> (fume) 1,50 mg/m <sup>3</sup> (dust)
Slovakia	NPHV (priemerná) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust) 0,1 mg/m <sup>3</sup> (fume)
Slovakia	NPHV (Hraničná) (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (dust) 0,2 mg/m <sup>3</sup> (fume)
Sweden	nivågränsvärde (NVG) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (total dust) 0,2 mg/m <sup>3</sup> (respirable dust)

Recommended monitoring procedures : Concentration measurement in air  
Personal air monitoring

<b>Copper Powder (7440-50-8)</b>	
DNEL/DMEL (general population)	
Acute - systemic effects, dermal	0,082 mg/kg bodyweight
Acute - systemic effects, inhalation	0,082 mg/kg bodyweight/day
Acute - systemic effects, oral	0,082 mg/kg bodyweight
Long-term - systemic effects, oral	0,041 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	0,041 mg/kg bodyweight/day
Long-term - systemic effects, dermal	0,041 mg/kg bodyweight/day
PNEC (water)	
PNEC aqua (freshwater)	7,8 µg/L
PNEC aqua (marine water)	5,2 µg/L
PNEC (sediment)	
PNEC sediment (freshwater)	87 mg/kg dwt
PNEC sediment (marine water)	676 mg/kg dwt
PNEC (soil)	
PNEC soil	65,5 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	230 g/l

## **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. :
Respiratory protection	: Use appropriate respiratory protection. Effective dust mask. (EN 149) Respirator with a particle filter (EN 143) : Full face mask (EN 136) Half-face mask (DIN EN 140) Filter type: P1
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.

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- 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/cm<sup>3</sup>
- 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 : No data available
- Explosive properties : Not applicable  
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/cm<sup>3</sup> @ 20°C

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

- Reactivity : Flammable solid.  
Reference to other sections: 10.5

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### **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.

<b>copper (7440-50-8)</b>	
LC50 fish 1	0,0068 - 0,0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0,03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
EC50 other aquatic organisms 1	0,0426 - 0,0535 mg/l (72 h - Pseudokirchneriella subcapitata)



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<b>copper (7440-50-8)</b>	
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 ())  
Proper shipping name IATA/IMDG : METAL POWDER, FLAMMABLE, N.O.S. (Coated Copper Flakes ())

### **14.3. Transport hazard class(es)**

#### **14.3.1. Overland transport**

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

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ADR/RID-Labels : 4.1 - Flammable solid



**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. : Copper Powder - copper

This product contains an ingredient according to the candidate list of Annex XIV of the REACH Regulation 1907/2006/EC. : none

Authorisations : Not applicable

**15.1.2. National regulations**

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DE : WGK : 2  
 DE : German storage class (LGK) : LGK 4.1B - Flammable solids  
 DE : TA-Luft : Total dust  
 FR : Installations classées : 1450;117X  
 NL : ABM : 5 - Very toxic to aquatic organisms (B)  
 NL : NeR (Nederlandse emissie Richtlijn) : Inorganic substances in powdered form

### 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 for data : European Metal Particulate Association (EMPA)

Abbreviations and acronyms : ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin  
 ADR = Accord européen relatif au transport international des marchandises Dangereuses 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 Explosion 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

The contents and format of this SDS are in accordance with EEC Commission Directive 1999/45/EC, 67/548/EC, 1272/2008/EC and EEC Commission Regulation 1907/2006/EC (REACH) Annex II.

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