

# SAFETY DATA SHEET

Version: 1.0 Date: 24<sup>th</sup> June 2021



ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

|  |  |
|--|--|
| <b>1.1 Product identifier</b>  |  |
| Product name   | IN718 <15 µm Metal Powder  |
| <b>1.2 Relevant identified uses of the substance or mixture and uses advised against</b> |  |
| Identified Use(s)  | Additive manufacturing, hot isostatic pressing, thermal spray, metal injection moulding, binder jetting. |
| Uses advised against   | Any other use.   |
| <b>1.3 Details of the supplier of the safety data sheet</b>                              |  |
| Company Identification   | Liberty Powder Metals Ltd.<br>Materials Processing Institute, Eston Road, Middlesbrough, TS6 6US         |
| Telephone  | +44(0)164 238 200  |
| E-mail (competent person)  | powders@libertysteelgroup.com  |
| <b>1.4 Emergency telephone number</b>  |  |
| Emergency Phone No.  | 999 / 911 or local emergency number  |
| Languages spoken   | Local language 24/7  |

## SECTION 2: HAZARDS IDENTIFICATION

|   |  |
|---|--|
| <b>2.1 Classification of the substance or mixture</b> |  |
| <b>2.1.1 Regulation (EC) No. 1272/2008 (CLP)</b>      | Skin Sens. 1; H317<br>Resp Sens. 1; H334<br>Carc. 1B; H350<br>Repr. 1B; H360F<br>STOT RE 1; H372<br>Aquatic Chronic 3; H412  |
| <b>2.2 Label elements</b>                             | According to Regulation (EC) No. 1272/2008 (CLP)   |
| Product name  | IN718 <15 µm Metal Powder  |
| Contains:   | Nickel and Cobalt  |
| Hazard Pictogram(s)                                   |  |
| Signal Word(s)  | DANGER   |
| Hazard Statement(s)                                   | H317: May cause an allergic skin reaction.<br>H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.<br>H350: May cause cancer.<br>H360F: May damage fertility.<br>H372: Causes damage to organs through prolonged or repeated exposure.<br>H412: Harmful to aquatic life with long lasting effects. |
| Precautionary Statement(s)                            | P201: Obtain special instructions before use.<br>P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.<br>P302+P352: IF ON SKIN: Wash with plenty of water.  |

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P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308+P313: IF exposed or concerned: Get medical advice/attention.

P342+P311: If experiencing respiratory symptoms: Call a doctor.

Supplemental information

Not applicable

## 2.3 Other hazards

May form combustible dust concentrations in air. Handling of this material may generate a dust which can cause mechanical irritation of the eyes, skin nose and throat.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2 Mixtures

EC Classification Regulation (EC) No. 1272/2008 (CLP)

| Chemical identity of the substance | %W/W | CAS No.   | EC No.    | REACH Registration No.               | Hazard classification   |
|------------------------------------|------|-----------|-----------|--------------------------------------|---|
| Nickel                             | < 60 | 7440-02-0 | 231-111-4 | Not yet assigned in the supply chain | Skin Sens. 1; H317<br>Carc. 2; H351<br>STOT RE 1; H372<br>Aquatic Chronic 3; H412   |
| Cobalt                             | < 1  | 7440-48-4 | 231-158-0 | Not yet assigned in the supply chain | Skin Sens. 1; H317<br>Resp Sens. 1; H334<br>Muta. 2; H341<br>Carc. 1B; H350<br>Repr. 1B; H360F<br>Aquatic Chronic 4; H413 |
| Manganese                          | < 2  | 7439-96-5 | 231-105-1 | Not yet assigned in the supply chain | Aquatic Chronic 2; H411   |

For full text of H phrases see section 16.

## SECTION 4: FIRST AID MEASURES



### 4.1 Description of first aid measures

Self-protection of the first aider

Obtain special instructions before use. No action should be taken involving personal risk. Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Do not breathe dust. Avoid contact with skin and eyes.

Inhalation

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention immediately.

Skin contact

IF ON SKIN: Gently wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Remove contaminated clothing and wash clothing before reuse.

Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation develops and persists, get medical attention.

Ingestion

IF SWALLOWED: Rinse mouth. Give plenty of water to drink. Do NOT induce vomiting. Seek medical treatment.

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

May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause cancer. May damage fertility. Causes damage to organs through prolonged or repeated exposure.

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

## SECTION 5: FIREFIGHTING MEASURES

5.1 **Extinguishing media**  
Suitable extinguishing media As appropriate for surrounding fire. Use CO<sub>2</sub>, dry chemical, or foam.  
Unsuitable extinguishing media Do not use water jet. Direct water jet may spread the fire.

5.2 **Special hazards arising from the substance or mixture**  
Explosion: May form combustible dust concentrations in air. Avoid dust generation. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Combustion products: Carbon monoxide, Carbon dioxide and Nickel carbonyl gas.

5.3 **Advice for firefighters**  
Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 **Personal precautions, protective equipment and emergency procedures**  
Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. No action should be taken involving personal risk. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe dust. Ensure adequate ventilation. Remove contaminated clothing and wash all affected areas with plenty of water. Avoid dust generation. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.

6.2 **Environmental precautions**  
Avoid release to the environment. Do not allow to enter drains, sewers or water courses.

6.3 **Methods and material for containment and cleaning up**  
Provided it is safe to do so, isolate the source of the leak. Sweep spilled substances into containers if appropriate moisten first to prevent dusting. Use non-sparking equipment when picking up flammable spill. Collect mechanically and dispose of according to Section 13. Use non-sparking tools. Ventilate the area and wash spill site after material pick-up is complete.

6.4 **Reference to other sections**  
See Section: 8,13.

## SECTION 7: HANDLING AND STORAGE

7.1 **Precautions for safe handling**  
When using do not eat or drink. Provide adequate ventilation when using the material and follow the principles of good occupational hygiene to control personal exposures. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not eat, drink or smoke when using this product. Remove contaminated clothing and wash clothing before reuse.

7.2 **Conditions for safe storage, including any incompatibilities**  
Keep only in original packaging. Keep in a well ventilated place. Keep container closed.  
Storage temperature Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources.

7.3 **Specific end use(s)**  
Incompatible materials Keep away from acids and strong oxidising agents.  
See Section: 1.2.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 **Control parameters**  
8.1.1 **Occupational exposure limits**  
The UK HSE (EH40) recommends the following limits for dusts: 10 mg/m<sup>3</sup> (8hr TWA) total inhalable dust; 4 mg/m<sup>3</sup> (8hr TWA) total respirable dust.

| SUBSTANCE | CAS No.   | LTEL (8 hr TWA ppm) | LTEL (8 hr TWA mg/m <sup>3</sup> ) | STEL (ppm) | STEL (mg/m <sup>3</sup> ) | Note |
|-----------|-----------|---------------------|------------------------------------|------------|---------------------------|------|
| Nickel    | 7440-02-0 | -                   | 0.5                                | -          | -                         | WEL  |

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|           |           |   |      |   |   |   |
|-----------|-----------|---|------|---|---|---|
| Cobalt    | 7440-48-4 | - | 0.1  | - | - | WEL, Carc                                 |
| Aluminium | 7429-90-5 | - | 10   | - | - | WEL                                       |
|           |           | - | 4    | - | - | Inhalable fraction<br>Respirable fraction |
| Manganese | 7439-96-5 | - | 0.2  | - | - | WEL                                       |
|           |           | - | 0.05 | - | - | Inhalable fraction<br>Respirable fraction |
| Silicon   | 7440-21-3 | - | 10   | - | - | WEL                                       |
|           |           | - | 4    | - | - | Inhalable fraction<br>Respirable fraction |
| Copper    | 7440-50-8 | - | 0.2  | - | - | WEL                                       |

Source: WEL: Workplace Exposure Limit (UK HSE EH40)

Note: Chemicals listed in Section 8 but not in Section 3 are not hazardous and do not impact the final mixture classification.

Carc. - Capable of causing cancer and/or heritable genetic damage.

- 8.1.2 Biological limit value** Not established
- 8.1.3 PNECs and DNELs** Not established
- 8.2 Exposure controls**
- 8.2.1 Appropriate engineering controls** Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Do not breathe dust. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).
- 8.2.2 Individual protection measures, such as personal protective equipment** Obtain special instructions before use. Keep good industrial hygiene. Wear appropriate personal protective equipment, avoid direct contact. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke at the work place. Do not breathe dust.
- Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.
- Eye/ face protection**  Wear eye protection with side protection (EN166). Eyewash bottles should be available.
- Skin protection**  **Hand protection:** Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Protective index 6, corresponding > 480 minutes of permeation time according to EN 374.
- Body protection:** Wear dust-resistant protective clothing.
- Respiratory protection**  Not normally required. Wear suitable respiratory protective equipment if processing involves working in areas where dusts or vapours are likely to be evolved. In case of inadequate ventilation wear respiratory protection. Recommended: EN143 Type A-P2.
- Thermal hazards** Not applicable.
- 8.2.3 Environmental exposure controls** Avoid release to the environment.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

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|  |  |
|--|--|
| Appearance                                   | Powder   |
| Odour  | Odourless.   |
| Odour threshold                              | Not applicable.  |
| pH   | No information available.  |
| Melting point/freezing point                 | 1210 - 1344°C  |
| Initial boiling point and boiling range      | No information available.  |
| Flash point                                  | No information available.  |
| Evaporation rate                             | No information available.  |
| Flammability (solid, gas)                    | Explosion: May form combustible dust concentrations in air.  |
| Upper/lower flammability or explosive limits | Maximum explosion pressure rise (Pmax) = 2.9 bar (BS EN 14034)<br>Coefficient of pressure rise (Kst) = 28 bar.m.s <sup>-1</sup> (BS EN 14034)<br>Maximum Rate of Pressure Rise (dP/dt) <sub>max</sub> = 103 bar.s <sup>-1</sup> (BS EN 14034)<br>St Class =1 (BS EN 14034)<br>Layer ignition temperature = >400°C (BS EN 50281-2-1)<br>LIT Value (> 400°C), minus 75°C Safety Factor = 325 °C<br>MIT Value (920°C), minus 1/3 Safety Factor = 613 °C<br>Capacitive & Inductive MIE = > 1000 mJ |
| Vapour pressure                              | No information available.  |
| Vapour density                               | No information available.  |
| Relative density                             | 8.22 g/cm <sup>3</sup>   |
| Solubility(ies)                              | No information available.  |
| Partition coefficient: n-octanol/water       | No information available.  |
| Auto-ignition temperature                    | No information available.  |
| Decomposition temperature                    | No information available.  |
| Viscosity                                    | No information available.  |
| Explosive properties                         | May form combustible dust concentrations in air.   |
| Oxidising properties                         | Not oxidising.   |
| <b>9.2 Other information</b>                 |  |
| Particle size                                | <15 µm   |
| Loss on Drying                               | No information available.  |
| Moisture Content                             | 0.0 % w/w  |

## SECTION 10: STABILITY AND REACTIVITY

|  |   |
|--|---|
| <b>10.1 Reactivity</b>                         | Stable under normal conditions.   |
| <b>10.2 Chemical stability</b>                 | Stable under normal conditions.   |
| <b>10.3 Possibility of hazardous reactions</b> | Hazardous polymerisation will not occur. May form combustible dust concentrations in air.   |
| <b>10.4 Conditions to avoid</b>                | Hydrogen gas can be liberated when nickel or its alloys react with acids. In reduced atmospheres nickel can react with carbon monoxide to form Ni(CO) <sub>4</sub> , which is an extremely toxic gas. |
| <b>10.5 Incompatible materials</b>             | Keep away from: acids and strong oxidising agents.  |
| <b>10.6 Hazardous decomposition products</b>   | Combustion products:, Carbon monoxide, Carbon dioxide and Nickel carbonyl gas.  |

## SECTION 11: TOXICOLOGICAL INFORMATION

|  |   |
|--|---|
| <b>11.1 Information on toxicological effects</b> |   |
| <b>Acute Toxicity - Ingestion</b>                | Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.   |
| <b>Acute Toxicity - Inhalation</b>               | Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) > 5 mg/L (Dust) |
| <b>Acute Toxicity - Skin contact</b>             | Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.   |
| <b>Skin corrosion/irritation</b>                 | Mixture: Based upon the available data, the classification criteria are not met.  |
| <b>Serious eye damage/irritation</b>             | Mixture: Based upon the available data, the classification criteria are not met.  |
| <b>Respiratory or skin sensitisation</b>         | Mixture:<br>Skin Sens. 1; H317: May cause an allergic skin reaction.  |

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|                                 |        |   |
|---------------------------------|--------|---|
|                                 |        | Resp Sens. 1; H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.  |
|                                 | Nickel | Skin Sens. 1; H317: May cause an allergic skin reaction.<br>EU Harmonised Classification  |
|                                 | Cobalt | Skin Sens. 1; H317: May cause an allergic skin reaction.<br>EU Harmonised Classification<br>Sensitisation (Guinea pig) - Positive (Liden, 1994)<br>Resp Sens. 1; H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.<br>EU Harmonised Classification |
| <b>Germ cell mutagenicity</b>   |        | Mixture: Muta 2; H341: Suspected of causing genetic defects.  |
|                                 | Cobalt | Muta 2; H341: Suspected of causing genetic defects.<br>EU Harmonised Classification   |
| <b>Carcinogenicity</b>          |        | Mixture: Carc. 1B; H350: May cause cancer.  |
|                                 | Cobalt | Carc. 1B; H350: May cause cancer.<br>EU Harmonised Classification   |
| <b>Reproductive toxicity</b>    |        | BMCL10: 0.414 mg/m <sup>3</sup> (mouse) (Behl, M. et al. 2015)<br>Mixture: Repr. 1; H360F: May damage fertility.  |
|                                 | Cobalt | Repr. 1; H360F: May damage fertility.<br>Reproductive - NOEL: 30 mg/kg bw/day (rat) (OECD 422)<br>Developmental toxicity - NOEL: 100 mg/kg bw/day (rat) (OECD 414)<br>Mixture: Based upon the available data, the classification criteria are not met.                            |
| <b>STOT - single exposure</b>   |        | Mixture: STOT RE 1; H372: Causes damage to organs through prolonged or repeated exposure.   |
| <b>STOT - repeated exposure</b> |        |   |
|                                 | Nickel | STOT RE 1; H372: Causes damage to organs through prolonged or repeated exposure.<br>EU Harmonised Classification<br>Oral: NOAEL – 2.2 mg/kg/bw day (rat) (Unnamed publication, 2007)<br>Inhalation: LOAEC – 0.1 mg/m <sup>3</sup> (rat) (OECD 451)<br>Dermal: No data             |
| <b>Aspiration hazard</b>        |        | Mixture: Based upon the available data, the classification criteria are not met.  |
| <b>11.2 Other information</b>   |        | None known  |

## SECTION 12: ECOLOGICAL INFORMATION

|   |           |  |
|---|-----------|--|
| <b>12.1 Toxicity</b>                      |           | Mixture: Aquatic Chronic 3; H412: Harmful to aquatic life with long lasting effects.<br>Estimated LC50 (Mixture): >10 - ≤ 100 mg/l   |
|   | Nickel    | Aquatic Chronic 3; H412: Harmful to aquatic life with long lasting effects.<br>EU Harmonised Classification<br>NOEC: 0.057 ug/L (Birge et al. 1984)  |
|   | Manganese | Aquatic Chronic 2; H411: Toxic to aquatic life with long lasting effects.<br>LC50: 0.17-15.61 mg/l (28 days) (U. S. National Library of Medicine, 2018)<br>No data for the mixture as a whole. |
| <b>12.2 Persistence and degradability</b> |           |  |
|   | Nickel    | Not applicable for inorganic substances.   |
|   | Cobalt    | Not applicable for inorganic substances.   |
|   | Manganese | Not applicable for inorganic substances.   |
| <b>12.3 Bioaccumulative potential</b>     |           | No data for the mixture as a whole.  |
|   | Nickel    | Low bioaccumulation potential.<br>BCF: 45 (Alikhan et al. 1989)  |
|   | Cobalt    | Low bioaccumulation potential.<br>BCF: 23 (Warnau et al. 1999)   |
|   | Manganese | Low bioaccumulation potential.<br>BCF: 19 (SOREN NORDAHL HANSEN, et.al. 1995)  |
| <b>12.4 Mobility in soil</b>              |           | No data for the mixture as a whole.  |
|   | Nickel    | The product is predicted to have high mobility in soil.<br>Log Kp: 4.51 (Elbaz-Poulichet et al. 1996)  |
|   | Cobalt    | The product is predicted to have high mobility in soil.<br>BMCL10: 0.414 mg/m <sup>3</sup> (Behl, M. et al. 2015)  |
|   | Manganese | The product is predicted to have low mobility in soil.   |

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|      |                                    |   |
|------|------------------------------------|---|
| 12.5 | Results of PBT and vPvB assessment | Kd: ~994 (OECD 106)                           |
| 12.6 | Other adverse effects              | Not classified as PBT or vPvB.<br>None known. |

## SECTION 13: DISPOSAL CONSIDERATIONS

|      |                         |  |
|------|-------------------------|--|
| 13.1 | Waste treatment methods | Do not allow to enter drains, sewers or watercourses. Dispose of this material and its container as hazardous waste. Disposal should be in accordance with local, state or national legislation. |
| 13.2 | Additional information  | Avoid release to the environment.  |

## SECTION 14: TRANSPORT INFORMATION

Not classified according to the United Nations 'Recommendations on the Transport of Dangerous Goods'.

|      | ADR/RID  | IMDG                      | IATA/ICAO   |
|------|--|---------------------------|---|
| 14.1 | UN number  | None assigned.            | None assigned.                                      |
| 14.2 | UN proper shipping name  | None assigned.            | None assigned.                                      |
| 14.3 | Transport hazard class(es)   | None assigned.            | None assigned.                                      |
| 14.4 | Packing group  | None assigned.            | None assigned.                                      |
| 14.5 | Environmental hazards  | Not classified            | Not classified                                      |
|      |  | Marine Pollutant.         |   |
| 14.6 | Special precautions for user                                       | See Section: 2            |   |
| 14.7 | Transport in bulk according to Annex II of Marpol and the IBC Code | No information available. | No information available. No information available. |

## SECTION 15: REGULATORY INFORMATION

|        |  |   |
|--------|--|---|
| 15.1   | Safety, health and environmental regulations/legislation specific for the substance or mixture |   |
| 15.1.1 | EU regulations   | Authorisations and/or restrictions on use Not restricted  |
| 15.1.2 | National regulations   | Germany Water hazard class: 2   |
| 15.2   | Chemical Safety Assessment   | A REACH chemical safety assessment has not been carried out. Exposure scenarios for substances in this preparation are not available. |

## SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Not applicable – V1.0

### References:

EU Harmonised Classification and ECHA registration dossier for Nickel (CAS No. 7440-02-0) and Cobalt (CAS No. 7440-48-4).  
ECHA registration dossier for Manganese (CAS No. 7439-96-5).

### Literature references

- Liden, C.; Wahlberg, J.E. 1994. Cross-reactivity to metal compounds studied in guinea pigs induced with chromate or cobalt. Acta Derm. Venereol. 74, 341-343.
- Behl, M. et al. 2015. Comparative toxicity and carcinogenicity of soluble and insoluble cobalt compounds. Toxicology 333, 195-205.
- Birge, W.J., J.A. Black, J.F. Hobson, A.G. Westerman, and T.M. Short. 1984. Water Resources Research Institute. Kentucky University, Lexington, KY. Research Report No. 151.
- U. S. National Library of Medicine. 2018. To determine long- term toxicity of test chemical on Oncorhynchus mykiss. HSDB (Hazardous Substances Data Bank); US national Library of Medicine reviewed by SRC.
- Alikhan, M.A., Zia, S. 1989. Nickel uptake and regulation in a copper-tolerant Decapod, Cambarus (Fabricius) (Decapoda, Crustacea). Bull. Environ. Contam. Toxicol. 42, 94-102.
- Warnau, M., S.W. Fowler, and J.L. Teyssie. 1999. Biokinetics of radiocobalt in the asteroid Asterias rubens (Echinodermata): sea water and food exposures. Marine Pollution Bulletin. 39(1-12):159-164.
- SOREN NORDAHL HANSEN, et.al. 1995. Marine Pollution Bulletin, 1995.

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8. Elbaz-Poulichet, F., Garnier, J.M., Guan, D.M., Martin, J.M., Thomas, A.J. 1996. The conservative behaviour of Trace metals (Cd, Cu, Ni, Pb) and As in the surface plume of stratified estuaries: example of the Rhone River (France). Estuarine, Coastal and Shelf Science: 42, 289-310.

EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830.

| Classification of the substance or mixture According to Regulation (EC) No. 1272/2008 (CLP) | Classification procedure |
|---|--------------------------|
| Skin Sens. 1; H317  | Threshold Calculation    |
| Resp Sens. 1; H334  | Threshold Calculation    |
| Carc. 1B; H350  | Threshold Calculation    |
| Repr. 1B; H360F   | Threshold Calculation    |
| STOT RE 1; H372   | Threshold Calculation    |
| Aquatic Chronic 3; H412   | Summation Calculation    |

## LEGEND

|           |   |
|-----------|---|
| ADR       | ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road        |
| BCF       | Bioconcentration factor   |
| BMCL10    | Benchmark concentration   |
| CAS       | Chemical Abstracts Service  |
| DNEL      | Derived No Effect Level   |
| EC        | European Community  |
| EN        | European Standard   |
| EU        | European Union  |
| IATA      | International Air Transport Association   |
| ICAO/IATA | ICAO: International Civil Aviation Organization / IATA: International Air Transport Association |
| IMDG      | International Maritime Dangerous Goods  |
| LC50      | Lethal concentration 50   |
| LD50      | Lethal dose 50  |
| LOAEC     | Lowest observed adverse effect concentration  |
| LTEL      | Long Term Exposure Limit  |
| NOEC      | No Observed Effect Concentration  |
| NOAEL     | No Observed Adverse Effect Level  |
| OECD      | Organisation for Economic Cooperation and Development   |
| PBT       | Persistent, Bioaccumulative and Toxic   |
| PNEC      | Predicted No Effect Concentration   |
| REACH     | Registration, Evaluation, Authorisation and Restriction of Chemicals                            |
| STEL      | Short Term Exposure Limit   |
| TWA       | Time Weighted Average   |
| UN        | United Nations  |
| vPvB      | Very Persistent and very Bioaccumulative  |
| WGK       | Wassergefährdungsklasse (Germany) / Water hazard class  |

## Hazard classification / Classification code:

Skin Sens. 1; Skin Sensitisation, Category 1  
Resp. Sens. 1; Respiratory sensitization, Category 1  
  
Muta. 2; Germ cell mutagenicity, Category 2  
Carc. 1B; Carcinogenicity, Category 1B  
Carc. 2; Carcinogenicity, Category 2  
Repr. 1B; Reproductive toxicity, Category 1B  
STOT RE 1; Specific target organ toxicity — repeated exposure, Category 1  
Aquatic Chronic 2; Hazardous to the aquatic environment, Chronic , Category 2  
Aquatic Chronic 3; Hazardous to the aquatic environment, Chronic , Category 3

## Hazard Statement(s)

H317: May cause an allergic skin reaction.  
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
H341: Suspected of causing genetic defects.  
H350: May cause cancer.  
H351: Suspected of causing cancer.  
H360F: May damage fertility.  
H372: Causes damage to organs through prolonged or repeated exposure.  
  
H411: Toxic to aquatic life with long lasting effects.  
  
H412: Harmful to aquatic life with long lasting effects.

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.



# SAFETY DATA SHEET

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**ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830**

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## **Annex to the extended Safety Data Sheet (eSDS)**

Exposure Scenarios are not applicable