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SAFETY DATA SHEET: MANGANESE (II) SULFIDE

Provided in accordance with Article 18(2) of Regulation (EC) No 1272/2008

SECTION 1: IDENTIFICATION

1.1 Product identifier:

Substance name: Manganese (II) sulfide
Other names: Manganese Sulphide, Manganese Sulfide,
Molecular Formula: MnS
EINECS number: 242-599-3
CAS number: 18820-29-6
REACH Registration number: [If applicable]
Unique formula identifier (UFI): Not applicable for this substance

1.2 Relevant identified uses of the substance/mixture and uses advised against:

Manufacture of powder metallurgy mix including packaging, compaction/sintering of powder metallurgy mixes - PC 7: Base metals and alloys
Machining of compacted sintered powder metallurgy mixes into final articles - PC 7: Base metals and alloys

Add or delete the above to suit your company's needs.

No known uses advised against.

1.3 Details of the supplier of the safety data sheet:

1.3.1 Name of supplier or manufacturer: (including address, phone numbers etc:

Complete as required.

1.3.2 Person responsible in EU member state / Only Representative information:

Complete as required.

1.4 Emergency telephone: **Complete as required (For EU add 112); CIAV # of receiving country.**

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

Classification according to Regulation (EC) No. 1272/2008 [CLP] and the UN GHS: Classified as Skin sensitization Cat 1; Skin irritation Cat2; Eye irritation cat 2.

2.2 Label elements:

Classification:	Skin Sens. 1; Eye Irrit. 2; Skin Irrit. 2
Pictogram	
Signal word	Warning

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Hazard statement	H315: Causes skin irritation. H317: May cause an allergic skin reaction. H319: Causes serious eye irritation.
Precautionary statement Prevention	P264, P261, P280,
Precautionary statement Response	P337+P313, P333+P313,
Precautionary Statement Disposal	P501
Additional Labelling requirements	EUH032: Contact with acids liberates very toxic gas (Hydrogen sulphide)

2.3 Other hazards:

None of the constituent substances are considered to meet the criteria to be included in the following hazard classes, at this time based on available information:

- ED HH (Endocrine disruption for human health)
- ED Env (Endocrine disruption for the environment)
- PBT (persistent, bioaccumulative, toxic),
- vPvB (very persistent, very bioaccumulative)
- PMT (persistent, mobile, toxic)
- vPvM (very persistent, very mobile)

None of the constituent substances were included in the list established in accordance with Article 59(1) for having endocrine disrupting properties, nor are they identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/210056 or Commission Regulation (EU) 2018/60557.

May form explosible dust-air mixture if dispersed.

See section 8 for personal protection. **Include other hazards if known.**

During handling: If a significant amount of dust is present, precautions should be taken to limit this exposure through normal control procedures such as local exhaust ventilation (LEV) or respiratory protective equipment (RPE).

During use: Fumes may be produced during the melting operations.

Oxides of corresponding components may be present in these fumes, some of which maybe hazardous. Precautions should be taken to limit this exposure through normal control procedures such as local exhaust ventilation (LEV) or respiratory protective equipment (RPE).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance: **[Amend as appropriate]**

Manganese sulfide is an inorganic mono-constituent substance. Its impurities are negligible and do not influence the classification.

Chemical name	EC No.	CAS number	Concentration % w/w	REACH Registration number
Manganese (II) sulfide	242-599-3	18820-29-6	Complete as per your substance	xx-xxxxxx-xx
Other minor impurities - specify			Complete as per your substance	Not applicable for impurities

3.2 Mixture: The substance is not a mixture.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures:

4.1.1 General information: Avoid contact with eyes and skin as the substance can cause eye irritation and skin sensitization. In case of accident or unwellness, seek medical advice immediately.



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- 4.1.2 **Following inhalation:** Do not inhale. Wear an appropriate mask. The substance if inhaled could irritate the lungs. **Include other relevant information based on your company's procedures.**
 - 4.1.3 **Following skin contact:** Wear appropriate protective equipment and avoid skin contact. Skin protection is a must. **Include information based on your company's procedures.**
 - 4.1.4 **Following eye contact:** Eye protection is a must. **Include information based on your company's procedures as well as the recommended specific goggle type.**
 - 4.1.5 **Following ingestion:** Do not ingest. Employ good industrial hygiene. **Include other relevant information based on your company's procedures.**
 - 4.1.6 **Self protection of the first aider:** **Include other information based on your company's procedures.**
- 4.2 **Most important symptoms and effects, both acute and delayed:** Dust particles will cause eye irritation/itchiness and lung irritation/coughing. Avoid skin contact as the substance is a skin sensitizer. These effects can be acute or delayed.
- 4.3 **Indication of any immediate medical attention and special treatment needed:** **Include information based on your company's procedures.**

SECTION 5: FIRE-FIGHTING MEASURES

- 5.1 **Extinguishing media:** MnS is not combustible under normal conditions of use. **Include information on any appropriate extinguishing media and any unsuitable extinguishing media based on your company's procedures.**
- 5.2 **Special hazards arising from substance or mixture:** Not combustible under normal conditions of use. Irritating or toxic gases may be generated by thermal decomposition of the substance. Metallic dust or powder may form an explosive mixture with air. **Include any other relevant information.**
- 5.3 **Advice for fire-fighters:** Not combustible under normal conditions of use but fine powders can combust. Wear suitable personal protective equipment (including self-contained breathing apparatus (SCBA) and full protective clothing) when extinguishing fires. **Include information based on your company's procedures.**

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

Appropriate skin and eye protection must be worn. Respirators must be worn where dust is a potential hazard. Gloves are a must. When dealing with powders avoid generating dust and remove all sources of ignition.

6.1.1 For non-emergency personnel:

- a) Use personal protective equipment. Dust masks is a must to minimise inhalation. Goggles and overalls are a must. See section 8 for more details
- b) Must have dust control and sufficient ventilation. Avoid all ignition sources.
- c) In the event of any accidental release, evacuate the area and consult trained personnel's – **Amend as per your company procedures.**

6.1.2 **For emergency responders:** Remove persons to safety. Isolate hazard area and deny entry. Ventilate closed spaces before entering. Use personal protective equipment, **specify which to use/which not to use see section 8 – Amend as per your company procedures.**

6.2 Environmental precautions:

Substance is not considered an environmental hazard based on available studies. However, it is advisable to keep away from drains/waterways, collect and reuse or dispose of according to the national laws. **Include other information based on your company's procedures.**

6.3 Methods and material for containment and cleaning up:

In the event of a spill, collect contaminated material and put in appropriate containers for disposal. Dispose of as special waste in compliance with local and national regulations.

6.3.1 **For containment:** Collect in closed and suitable containers for disposal or reuse. **Include other information based on your company's procedures.**

6.3.2 **For cleaning up:** Spills should be contained and recovered mechanically if possible. Collect dust or particulates using a vacuum cleaner with a high efficiency particulate air (HEPA) filter. Place in a designated, labelled waste container. Dispose of in accordance with



local regulations. Contaminated objects and areas thoroughly observing environmental regulations -include cleaning and vacuuming techniques. **Amend as per your company's procedures – include cleaning and vacuuming techniques.**

6.3.3 Other information: Avoid excessive dust generation. Material may be reclaimed for re-use. **Include other information based on your company's procedures such as cleaning up techniques/materials never to be used.**

6.4 Reference to other sections: Personal protective equipment: see section 8 & 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

7.1.1 Recommendations:

- a) Use only in well-ventilated areas. Avoid generating dust. Wear personal protective clothing, especially the recommended masks, overalls and gloves (see Section 8). **Include other information based on your company's procedures.**
- b) Avoid handling with incompatible substances/mixtures **(List incompatible substances if known)**
- c) Avoid dust generating operations or must be carried out in properly ventilated areas while wearing appropriate PPE
- d) Capture dust, if possible, if generated, vacuum dust and compress into pellets to minimize environmental exposure and recycle if possible- **Amend as per company procedures**

7.1.2 Advice on general occupational hygiene:

- a) Do not eat, drink or smoke in work areas.
- b) Wash hands before and after use and keep them dry.
- c) Remove contaminated clothing and personal protective equipment before entering eating areas - **Include other information based on your company's procedures.**

7.2 Conditions for safe storage, including any incompatibilities:

7.2.1 Specific storage requirements:

- a) Risk management associated to physical and chemical properties
- i) Explosive atmosphere: The substance is not explosive, however, store material away from possible explosive materials
- ii) Corrosive conditions: The substance does not corrode metal, hence no adverse corrosive effects are expected
- iii) Flammability hazard: The substance is not flammable, however, keep away from flammable materials
- iv) Incompatible substances or mixtures: Contact with acids liberates toxic gases. **List others if known.**
- v) Evaporative conditions: Avoid storage around organic evaporative materials/substances. The substance does not evaporate under normal conditions of use.
- vi) Potential ignition sources: Keep away from ignition sources
- b) How to control effects from environmental conditions: (i) Weather conditions, (ii) ambient pressure, (iii) varying temperatures, (iv) sunlight, (v) humidity and (vi) vibration do not affect the integrity of the substance. However, storage environments should not be humid – **Amend as per your company's procedures.**
- c) How to maintain the integrity of the substance: (i) Stabilisers and (ii) antioxidants are not required. The substance is very stable under normal conditions of use. It does not decompose or disintegrate. Stabilisers and antioxidants are not required.
- d) other advice
 - i) Ventilation requirements: Ensure adequate ventilation and store at room temperature.
 - ii) Specific designs for storage: Keep/store only in original container/packaging. **Include other information based on your company's procedures.**
 - iii) Quantity limits under storage conditions: There is no limitation as the substance does not pose any physical and chemical hazards.
 - iv) Packaging compatibility: Store in original/similar packaging. Protect container/packaging against damage – **Amend as per company's procedures.**



7.3 Specific end uses(s):

Observe instructions for use and see exposure scenarios – Annex 1.

SECTION 8: EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control Parameters:

8.1.1 Occupational exposure limits: The EU SCOEL OEL values for Manganese and its inorganic compounds are 0.2mg/m³ – inhalable and 0.05mg/m³ respirable.

8.1.1.1 National limits: **Include other relevant country specific workplace limits.**

8.1.1.2 Union limits: 0.2mg/m³ inhalable and 0.05mg/m³ respirable

8.1.1.3 Any other national exposure limit values: **Include if available.**

8.1.1.4 Union biological limit values: No union biological limit values exist for Inorganic manganese and its compounds.

8.1.1.5 Any other national biological limit values: **Include if available.**

8.1.2 Monitoring procedures: Dust monitoring is recommended. **Provide as per national laws/company procedures.**

8.1.3 Formation of air contaminants: The substance does not produce air contaminants under normal conditions of use. OEL/BLV are therefore not provided **Amend as per your company's use.**

8.1.4 Derived No Effects Limits (DNELs)/Predicted No Effects Concentrations (PNECs):

Hazard assessment conclusion for Workers: DNELs

Route	Type of effect	Hazard conclusion	Most sensitive endpoint
Inhalation	Systemic effects - Long-term	DNEL (Derived No Effect Level) 0.2mg/m ³	neurotoxicity
Inhalation	Systemic effects - Acute	no-threshold effect and/or no dose-response information available	
Inhalation	Local effects - Long-term	no-threshold effect and/or no dose-response information available	
Inhalation	Local effects - Acute	no-threshold effect and/or no dose-response information available	
Dermal	Systemic effects - Long-term	DNEL (Derived No Effect Level) 0.00414mg/kg bw/day	neurotoxicity
Dermal	Systemic effects - Acute	no-threshold effect and/or no dose-response information available	
Dermal	Local effects - Long-term	no-threshold effect and/or no dose-response information available	
Dermal	Local effects - Acute	DNEL (Derived No Effect Level) 117.5µg/cm ²	sensitisation (skin)
Eyes	Local effects	medium hazard (no threshold derived)	

Hazard assessment conclusion for the Environment: PNECs

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Compartment	Hazard conclusion	Remarks/Justification
Freshwater	PNEC aqua (freshwater): 0.0108mg/L Intermittent releases: 0.049mg/L	Assessment factor: 50 Extrapolation method: assessment factor PNEC aqua (freshwater) Two chronic NOEC values in algae and Daphnia are available. The Daphnia NOEC of 0.54 mg/l is selected as the key value. PNEC intermittent release hazard assessment conclusion: PNEC aqua (intermittent releases) PNEC intermittent release assessment factor: 100.0 PNEC intermittent release extrapolation method: assessment factor PNEC intermittent release justification: Lowest L(E)C50 value from fish, Daphnia and algal studies. The key value is ErC50 = 4.9 mg/l from the algal growth study.
Marine water	PNEC aqua (marine water): 0.00108mg/L Intermittent releases:	Assessment factor: 500 Extrapolation method: assessment factor PNEC aqua (marine water) Two chronic NOEC values in algae and Daphnia are available. The Daphnia NOEC of 0.54 mg/l is selected as the key value. An additional assessment factor of 10 applies to the marine compartment.
Sediments (freshwater)	PNEC sediment (freshwater): 1.53mg/kg sediment dw	Assessment factor: 500 Extrapolation method: assessment factor PNEC sediment (freshwater) Equilibrium partitioning based on freshwater aquatic PNEC and Kd value of 650 ml/g. The tenfold safety factor is added to account for ingestion of compound bound to sediment.
Sediments (marine water)	PNEC sediment (marine water): 0.153mg/kg sediment dw	Assessment factor: 5000 Extrapolation method: assessment factor PNEC sediment (marine water) Equilibrium partitioning based on freshwater aquatic PNEC and Kd value of 650 ml/g. The tenfold safety factor is added to account for ingestion of compound bound to sediment.
Sewage treatment plant	PNEC STP: 100mg/L	Assessment factor: 10 Extrapolation method: assessment factor PNEC STP Activated sludge Respiration/inhibition test. NOEC = 1000mg/l
Soil	PNEC soil: 6.2mg/kg soil dw	Assessment factor: 10 Extrapolation method: assessment factor PNEC soil Equilibrium partitioning based on aquatic PNEC and Kd value of 650. The tenfold safety factor is added to account for ingestion of compound bound to soil
Air	no hazard identified:	
Secondary poisoning	no potential for bioaccumulation:	According to the Guidance on information requirements and chemical safety assessment, Chapter R.11: PBT assessment, "the PBT and vPVB criteria of Annex XIII to the regulation do not apply to inorganic substances". Therefore, MnS is not considered to require any further assessment of PBT properties.

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8.1.5 Control banding: A control banding approach is not used to decrease risk management measure during the use of this substance for the uses specified in section 1.2.

8.2 **Exposure controls:** See Exposure scenarios on, Annex 1

8.2.1 Appropriate engineering controls: Dust is trapped and recycled where possible. Wastewater is collected for treatment and recycled. **Amend as per your company's procedures.**

8.2.2 Individual protective measures: Overalls, goggles and masks are mandatory during use.

8.2.2.1 Other non-personal protection: Good industrial hygiene is a must. Keep and use in well ventilated areas. See section 5 for more information **Amend as per your company's procedures.**

8.2.2.2 CEN stand requirement for protective equipment: (Please state the quality/standard/thickness of the personal protective equipment used by your organisation)

a) Eye/face protection: Face protection is mandatory. **complete as per your company procedures e.g. type of goggles**

b) Skin protection: Overalls, gloves and boots are mandatory as the substance is a skin irritant and a skin sensitizer (Please specify type of overall, gloves, boots including the thickness of material.

c) Respiratory protection: N95 Mask (Amend as per your company procedures)

d) Thermal hazards: Not applicable

8.2.3 Environmental exposure controls: The substance is not harmful to the environment. However, avoid dust generation, and do not wash spillages into drainage system as material may block drains. See Annex I, Exposure scenarios. (Please include environmental controls employed by your company)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES [the information below is based on available literature and studies]

9.1 General information	
State	Solid
Colour	Dark green
Odour	Odourless
Melting point (Mpt) / Freezing point	>723 K (>450°C), Regulation (EC) No. 440/2008, Annex, A1
Boiling point or initial boiling point/boiling range	Melting pt >300°C, hence study not applicable
Flammability of solids	Not flammable, Regulation (EC) No. 440/2008, Method A10
Lower and upper explosion limit	Not applicable to solids
Flash Point	Not applicable to solids
Auto-ignition temperature	Not applicable to solids
Decomposition temperature	Not applicable to inorganic solids
pH	Include if known (where the substance is a solid, the pH of an aqueous solution at a given concentration shall be indicated)
Kinematic viscosity	Not applicable to solids
Solubility	Soluble: 6.16 x 10 ⁻³ g/L at 20±0.5°C., Regulation (EC) No. 440/2008, Annex A6
Partition Coefficient	Not applicable for inorganic substances
Vapour pressure	Study not conducted as Mpt >300°C
Density /Relative density	3.99 at 22.5. +/- 0.5°C, Regulation (EC) No. 440/2008, Annex, A3
Relative Vapour density	Not applicable to solids
Particle characteristics	Include PSD study results
9.2 Other information	
None	
9.2.1 Physical hazard classes	
Explosives properties	Non explosive

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Flammable gases	Not applicable as the substance is a solid
Aerosols	Not applicable under normal conditions of use
Oxidizing gases	Not applicable as the substance is a solid
Gases under pressure	Not applicable as the substance is a solid
Flammability of liquids/Solids	Not flammable
Self-reactive substances and mixtures	Not self-reactive
Pyrophoric liquids	Not applicable as the substance is a solid
Pyrophoric solids	Does not have pyrophoric properties
Self-heating substances and mixtures	Spontaneous ignition does not occur
Substances and mixtures which emit flammable gases in contact with water	Predicted not to emit flammable gases upon contact with water
Oxidising Liquids/solids	Non oxidising, Method A17
Organic peroxides	Not applicable to inorganic substances
Corrosive to metals	The substance is not corrosive to metals
Desensitised explosives	Not applicable
Bulk density	Unknown
9.2.2 Other	Contact with acids liberates very toxic gas (Hydrogen sulphide)

SECTION 10: STABILITY AND REACTIVITY [Amend information below to conform to your company information]

10.1 Reactivity: The substance does not contain reactive functionalities.

10.1.1 **Reactivity hazard of substance:** Not applicable for inorganic substances

10.1.2 **Reactivity hazard of mixture:** Not applicable as the substance is not a mixture.

10.2 Chemical stability: The substance is chemically stable under recommended conditions of storage, use and temperature.

10.3 Possibility of hazardous reaction: No hazardous reaction when handled and stored according to provisions.

10.4 Conditions to avoid: Include your company's information.

10.5 Materials to avoid: Reactive or incompatible with the following materials: oxidizing materials, acids, and moisture. Include other information based on your company's procedures

10.6 Hazardous decomposition products: Does not decompose when used for intended uses. Include your company's information.

SECTION 11: TOXICOLOGICAL INFORMATION [The information in this section is from experimental data and other available literature]

11.1 Information on toxicological effects:

a) Acute toxicity: Based on available data, the classification criteria are not met

Acute oral toxicity: Not acutely toxic (LD50: >2000 mg/kg bw)

Acute dermal toxicity: Predicted not to be acutely toxic upon dermal exposure.

Acute inhalation toxicity: Not acutely harmful by inhalation (LC50 > 5.34 mg/L)

b) Skin corrosion/irritation: Based on available data, the classification criteria are met

Not corrosive to the skin but irritating to the skin (EPISKIN reconstituted human epidermis model).

c) Serious eye damage/irritation: Based on available data, the classification criteria are met

An eye irritant (SKINETHIC reconstituted human epithelium model)

d) Respiratory or skin sensitization: Based on available data, the classification criteria are met

A skin sensitizer (method B.42, Local lymph node assay). Predicted not to be a respiratory sensitizer.

e) Germ cell mutagenicity: Based on available data, the classification criteria are not met

Negative in all tests conducted using a MnCl₂ – a very soluble salt considered as a worse-case evaluation:

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- Ames test with *S. typhimurium* TA 98, TA 100, TA 1535, TA 1537, *E. coli* WP2 uvrA (Met. act.: with and without) (OECD TG 471, EU method B13 and GLP); No toxicity was observed up a concentration of 5000 ug/plate.
- Mammalian cell gene mutation assay with mouse lymphoma L5178Y cells (met. act.: with and without) (OECD 476 and GLP); Negative for mouse lymphoma Cytotoxicity: Yes, induced toxicity was not at the highest dose.
- In-vitro mammalian chromosome aberration test with human lymphocytes (Met. act.: with and without) (OECD guideline 473 and GLP). Negative for lymphocytes. Cytotoxicity: Yes
- f) Carcinogenicity: Based on available data, the classification criteria are not met
There are no specific studies on carcinogenicity for this substance. However, carcinogenicity report (NTP, 1993) on MnSO₄ (more soluble/more bioavailable substance) and an expert review by Jenkinson, 2009 on genotoxicity as well as peer review article (Assem et al, 2011) concluded – no concerns, carcinogenicity in humans is not expected.
- g) Reproductive toxicity: Based on available data, the classification criteria are not met
There are no specific studies on reproductive parameters for this substance. However, studies exist on a more soluble/bioavailable manganese form - two generation reproductive toxicity study on the male/female rats using MnCl₂ via inhalation (OECD guideline 416, GLP) concluded: No treatment related effects at 20 mg/m³ air in F0, F1 and F2 generations (Jardine L, 2013 and McGough & Jardine, 2017) - Not toxic to reproduction
A Prenatal-developmental toxicity study using MnCl₂ via inhalation (OECD 414, GLP): concluded no fetal abnormalities at not specified at 15 mg/m³ (Dettwiler M, 2016)
- h) Specific target organ toxicity (Single exposure):
Based on available data the classification criteria are not met.
- i) Specific target organ toxicity (repeated exposure): Data is limited and inclusive
Published literature is unavailable in other to assess this endpoint. However, toxicity via inhalation has been reported from repeated exposure to other forms of manganese.
- j) Aspiration hazard: Data lacking

11.2 Information on other hazards:

11.2.1 **Endocrine disrupting properties:** The substance is not considered an endocrine disruptor based on available literature – Data lacking.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity:

- a) Acute (short-term) & Chronic (long-term) toxicity: Based on available data, the classification criteria are not met
Based on available studies and using the CLP and GHS classification criteria, the substance does not meet the classification as an environmental hazard. PNEC's for fresh and marine water for this substance are much lower than the background concentration of manganese in European waters - (15.9 µg Mn/L in surface water; "Probabilistic Distribution of Manganese in European Surface Water, Sediment and Soil and Derivation of Predicted Environmental Concentrations (PEC)", Parametrix, 2009 and supported by GEMAS data).

12.2 **Persistence and degradability:** Not persistent based on knowledge of the constituent substances

12.3 **Bioaccumulative potential:** Not bioaccumulative based on knowledge of the constituent substances

12.4 **Mobility in soil:** Insignificant solubility in water, immobile

12.5 **Results of PBT, vPvB, PMT, vPvM assessment:** Not PBT, vPvB, PMT and vPvM based on knowledge of the constituent substances

12.6 **Endocrine disrupting properties:** No endocrine disrupting properties based on knowledge of the constituent substances

12.7 **Other adverse effects:** The substance is an inorganic metallic compound with no ozone layer depletion potential. **Include your company's information**

SECTION 13: DISPOSAL CONSIDERATIONS **Include your company's information**

13.1 **Waste treatment methods: Recycle** when possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste

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disposal legislation and any regional local authority requirements. The product is not hazardous, and waste may be disposed of by landfill.

13.1.1 Physical/chemical properties that affect waste treatment options: Generally, solid waste should be separated and reused. Recycling is encouraged.

13.1.2 Sewage disposal: Sewage disposal is discouraged. **Include other information based on your company's procedures.**

13.1.3 Precautions for recommended waste treatment options: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers

13.1.4 Other relevant provisions related to waste: Handle contaminated packages in the same way as the product itself. **Include other information based on your company's procedures as well as national laws.**

SECTION 14: TRANSPORT INFORMATION

Transport may take place according to national regulations or land transport (ADR/RID), sea transport (IMDG) or Air transport (ICAO-TI/IATA-DGR).

14.1 UN Number: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.2 UN proper shipping name: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.3 Transport hazard class: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.4 Packaging group: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.5 Environmental hazard: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.6 Special precautions for users: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

14.7 Transport in bulk according to Annex II of MARPOL73/78 and ISBC code: The material is not classified as hazardous for transport (ADR, RID, UN RTDG, IMO, IATA/ICAO).

SECTION 15: REGULATORY INFORMATION **[Delete as appropriate and include regulatory information specific to your country...]**

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture	Labelling is required: See section 2. UN GHS – UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS): According to Chapter 1.5.2 of the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS) safety data sheets (SDS) are only required for substances and mixtures that meet the harmonized criteria for physical, health or environmental hazards. This substance meets this criterion. EU CLP – Classification Labeling and Packaging Regulation: According to Article 59(2)(b) of (EC) No 1272/2008 (CLP), which amends REACH article 31(1), safety data sheets (SDS) are only required for substances and mixtures/special preparations that meet the harmonised criteria for physical, health or environmental hazards. This substance meets this criterion. EU REACH – Registration, Evaluation and Authorisation of Chemicals: REACH article 31(7) requires relevant exposure scenarios from the Chemical Safety Report (CSR) to be annexed to the SDS. These exposure scenarios are only
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	required for hazard-classified substances or mixtures. This substance is hazard-classified according to CLP, therefore exposure scenarios are required.
15.2 Chemical Safety Assessment	A chemical safety assessment has been carried out because the substance is classified as hazardous – see section 2. Exposure scenarios are mandatory and available.

SECTION 16: OTHER INFORMATION	
a) Updated sections	Main changes: 2.3 Other hazards, 5 Fire fighters, 8.2 Exposure controls, 10 Stability and reactivity 13.1 waste treatment methods, 14 Transport, 15 Regulatory information, 16 other information Editorial changes throughout the document.
b) A key/legend to abbreviations and acronyms used in the SDS should be added in this section	ADN – European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road BCF – Bioconcentration Factor CAS – Chemical Abstract Service CL – Concentration limits CLP – Classification, Labelling and Packaging Regulation (EC) No. 1272/2008 DMEL – Derived Minimal Effect Level DNEL – Derived No Effect Level EC – European Commission ED Endocrine Disruption EL50 – Half maximal effect loading rate (Loading rate halfway between the maximum and baseline of an effect) EC50 – Half maximal effect concentration (Concentration halfway between the maximum and baseline of an effect) ErC50 – Half maximal effect concentration growth rate (Concentration halfway between the maximum and baseline of an effect) ECHA – European Chemicals Agency GHS – Globally Harmonized System of Classification and Labelling of Chemicals IATA – International Air Transport Association IBC – Intermediate Bulk Carrier IMDG – International Maritime Dangerous Good LC50 – Median lethal concentration (Concentration which causes 50 % mortality of the test population) LD50 – Median lethal dose (Dose which causes 50 % mortality of the test population) LL50 – Median Lethal Load (Dose which causes 50 % mortality of the test population) MARPOL – International Convention for the Prevention of Pollution from Ships NOAEL – No Observed Adverse Effect Level NOEL – No Observed Effect Level OEL – Occupational Exposure Limit PNEC – Predicted No Effect Concentration PBT – Persistent, Bioaccumulative, Toxic REACH – Registration, Evaluation, Authorisation, and restriction of Chemicals - Regulation (EC) No. 1907/2006

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			STOT– Specific Target Organ Toxicity TWA – Time Weighted Average vPvB – Very Persistent and Very Bioaccumulative
c)	Literature references and sources of data		IFA: GESTIS - International limit values for chemical agents https://chem.echa.europa.eu/100.038.711/dossier-list/reach/dossiers/active?searchText=242-599-3
d)	Classification derivation		The classification of the substance is based on the available data on the substance itself.
e)	Precautionary notes		During melting, pickling and welding stages (strongly oxidizing conditions), oxides of several metals may be present in the effluent fumes. Suitable precautions should be taken to minimize exposure of personnel to such fumes. Any moisture in the material should be regarded as an explosion hazard if it is to be used in high temperature environment.
f)	Disclaimer		This substance meets the EU Regulation No. 1907/2006 requirements for a mandatory safety data sheet. This information sheet acts as a template for MARA members. To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability whatsoever for the accuracy and completeness of such information.
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Include Annex 1 – Exposure scenarios