1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

1.1. Product identifier

Name:	Tetrapotassium hexacyanoferrate.
Synonyms :	Potassium ferrocyanide trihydrate
CLP Annex VI, part 3, index nr.	--
EC/EINECS No. :	237-722-2 (anhydrous)
CAS No.	13943-58-3 (anhydrous), 14459-95-1 (trihydrate)
Registration nr :	01-2120768449-37-0000

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Intended use :

	Formulation
F-1	**Formulation as anti-caking agent in anti-freeze, de-icing product** Further description of the use: Contributing activity/technique for the environment: **- ERC2: Formulation into mixture** Contributing activity/technique for the workers: **- PROC 4: Chemical production where opportunity for exposure arises** **- PROC 5: Mixing or blending in batch processes** **- PROC 8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities** **- PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities** **- PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)** **Product Category formulated:** PC 4: Anti-freeze and de-icing products **Technical function of the substance:** intermediate (precursor); Anti-caking agent Tonnage of substance for that use: ca.20 tonnes/year Substance supplied to that use: as such; in a mixture Related assessment: use not assessed
F-2	**Use of the substance in mixtures to treat metal surfaces with** Further description of the use: Contributing activity/technique for the environment: **- Formulating the mixture (ERC2)** Contributing activity/technique for the workers: **- PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions; PROC 5: Mixing or blending in batch processes ; PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)** **Product Category formulated:** PC 14: Metal surface treatment products **Technical function of the substance:** plating agent

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	Substance supplied to that use: as such Related assessment: use not assessed

	Uses at industrial sites
IW-1	**Treatment of metal** Further description of the use: Contributing activity/technique for the environment: **- ERC5: Use at industrial site leading to inclusion into/onto article** Contributing activity/technique for the workers: **- PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions ; PROC 5: Mixing or blending in batch processes ; PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)** **Product Category used:** PC 14: Metal surface treatment products **Sector of end use:** SU 14: Manufacture of basic metals, including alloys **Technical function of the substance:** plating agent ; Metal surface treatment (e.g. galvanization and electroplating) Substance supplied to that use: as such ; in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-2	**Treatment of Wines/Juices** Further description of the use: Removal of metals from wine/juice Contributing activity/technique for the environment: **- ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)** Contributing activity/technique for the workers: **- PROC 5: Mixing or blending in batch processes; PROC 9: Transfer of substance or** **mixture into small containers (dedicated filling line, including weighing)** **Product Category used:** PC 20: Products such as ph-regulators, flocculants, precipitants, neutralization agents **Sector of end use:** SU 4: Manufacture of food products **Technical function of the substance:** solids separation (precipitating) agent Substance supplied to that use: as such; in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-3	**Prussian Blue production** Further description of the use: Potassium Ferrocyanide is manually added to a make down tank in combination with Manganese Sulphate and water to form Prussian Blue pigment which is then added to paper during production. Contributing

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	activity/technique for the environment: **- ERC5: Use at industrial site leading to inclusion into/onto article** Contributing activity/technique for the workers: **- PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated** **facilities** **Product Category used:** PC 26: Paper and board treatment products **Sector of end use:** SU 6b: Manufacture of pulp, paper and paper products **Technical function of the substance:** intermediate (precursor) Substance supplied to that use: as such; in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed
IW-4	**Assisting in the production of polymers**
	Further description of the use: Contributing activity/technique for the environment: **- ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)** **- Use as catalyst (ERC6d)** Contributing activity/technique for the workers: **- Mixing with other compounds (PROC 4; PROC 8b ; PROC 9) Product Category used:** PC 32: Polymer preparations and compounds **Sector of end use:** SU 11: Manufacture of rubber products **Technical function of the substance:** catalyst Substance supplied to that use: as such; in a mixture Subsequent service life relevant for that use: no Related assessment: use not assessed.
	Uses by professional workers
PW-1	**Professional use as anti-freeze, de-icing product** Further description of the use: Contributing activity/technique for the environment: **- ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article,** **outdoor)** Contributing activity/technique for the workers: **- PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities [EU REACH]** **- PROC 11: Non-industrial spraying** **Product Category used:** PC 4: Anti-freeze and de-icing products **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products) ; SU 9: Manufacture of fine chemicals **Technical function of the substance:** anticaking agent ; antifreeze agent Subsequent service life relevant for that use: no

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	Related assessment: use not assessed
PW-2	**Laboratory chemical** Further description of the use: Use as a reactant or aid in small scale chemical synthesizes. Contributing activity/technique for the environment: **- ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor); ERC8b: Widespread use of reactive processing aid (no inclusion into or onto article, indoor)** Contributing activity/technique for the workers: **- PROC 15: Use as laboratory reagent** **Product Category used:** PC 21: Laboratory chemicals **Sector of end use:** SU 24: Scientific research and development **Technical function of the substance:** intermediate (precursor). Subsequent service life relevant for that use: no Related assessment: use not assessed

	Consumer uses
C-1	**Consumer use as anti-freeze, de-icing product** Further description of the use: Contributing activity/technique for the environment:
	- ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article,outdoor) Contributing activity/technique for consumers: **- PC 4: Anti-freeze and de-icing products** **Technical function of the substance:** anticaking agent; antifreeze agent Subsequent service life relevant for that use: no Related assessment: use not assessed

1.2.2 Uses advised against — no additional information

1.3 Details of the supplier of the safety datasheet

Supplier :

GENTROCHEMA BV
Esdoornlaan 19a, NL-4254 AT Sleeuwijk, Nederland
Tel. : +31.183.304422 Fax : +31.183.304069
E-mail : gentrochema@pms.nl Website : www.gentrochema.nl

Emergency telephone nr :

during office hours (08:30 - 17:00) : +31.183.304422
After office hours (*only for health professionals*) : +44.870.600.6266

2. HAZARDS IDENTIFICATION

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2.1 Classification of the substance

2.1.1. Classification according to Regulation 1272/2008 EC

-

2.1.2. Classification according to Regulation 67/548/EC

-

2.2 Label elements

2.2.1. Labelling according to Regulation 1272/2008 EC

EUH032: Contact with acids liberates very toxic gas

Precautionary statement(s)

P261: Avoid breathing dust.
P262: Do not get in eyes, on skin, or on clothing

2.3. Other hazards

No additional information

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Chemical characterization: Tetrapotassium hexacyanoferrate, min. 99 % $K_4(FeCN)_6$, with non hazardous additions

Composition/information on ingredients:

EINECS nr: 237-722-2 (anhydrous)
CAS nr: 13943-58-3 (anhydrous), 14459-95-1 (trihydrate)
Index No. ----

EUH032: Contact with acids liberates very toxic gas

4. FIRST AID MEASURES

4.1 Description of first aid measures

- General information : No typical symptoms and effects are known.

- After inhalation : Remove to fresh air.
If not breathing give artificial respiration.
If breathing is difficult, give oxygen.
Call a physician.

- After skin contact : Immediately flush skin with copious amounts of water.

- After eye contact : Immediately flush eyes with copious amounts of water, keeping eyelids open.

- After swallowing : Drink plenty of water, provided person is conscious and induce vomiting. Call a physician.

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

To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

4.3 Indication of any immediate medical attention and special treatment needed

No additional information

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide
Non-suitable extinguishing media: Not known

5.2 Special hazards arising from the substance

development of toxic and irritating decomposition products.

5.3 Advice for fire-fighters

Wear self contained breathing apparatus if necessary.
Contact with acids liberates very toxic gas (Hydrogen Cyanide)

5.4 Further information

Product is not combustible.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid causing dust. Ensure adequate ventilation.

6.2 Environmental precautions

No special protections required.

6.3 Methods and materials for containment and cleaning up

Pick up spilled product, keep in a closed container and hold for waste disposal.

6.4 Reference to other sections

For safe use: refer to section 7
For personal protection: refer to section 8.
For disposal: refer to section 13

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid causing dust. Do not breathe dust.
Avoid contact with skin and eyes.

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7.2 Conditions for safe storage, including any incompatibilities

Avoid exposure to sun light.
Other information: For quality reasons; Store in a cool dry place.

7.3 Specific end uses

No additional information

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

The substance does not fulfil the criteria for any of the hazard classes or categories set out in Annex 1 to CLP Regulation (EC) No 1272/2008 (nor is assessed to be a PBT or vPvB substance). Hence, according to article 14(4) of the REACH regulation, exposure assessment is not required.

Personal protection:

Observe usual precautions during handling of this substance.

Other information:

No additional information

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 information on basic physical and chemical properties

Appearance:	Solid, odourless, (light) yellow crystals.
Odour:	odourless
Odour threshold:	Not available
PH-value:	approx. 10 (10 % solution)
Alkalinity or acidity:	Not available.
Boiling point:	substance decomposes before a boiling point could be reached.
Melting point:	substance decomposes before a melting point could be reached.
Flash point:	Not relevant
Evaporation rate:	Not relevant
Flammability:	Not classified.
Vapour pressure:	Not relevant
Vapour density:	Not relevant
Specific gravity/Density:	1.853 at 20 °C
Solubility in water:	254 g/l at 20 °C
Solubility in other solvents:	Not available
Partition coefficient n-octanol/water:	Not relevant (inorganic substance)
Auto ignition temperature:	non-combustible and non-flammable
Decomposition temperature:	> 60 °C the trihydrate form will lose its crystalwater
Viscosity:	Not relevant
Explosive properties:	None.
Oxidising properties:	None.

9.2. other information

No additional information.

10. STABILITY AND REACTIVITY

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10.1 Reactivity

Hazardous reaction with acids.
Stable under circumstances as advised in section 7.

10.2 Chemical stability

Avoid exposure to sun light.

10.3 Possibility of hazardous reactions

Do not mix with acids, oxidisers, nitrite and nitrate salts.
Reacts violently with ammonia and sodium chromate

10.4 Conditions to avoid

Avoid exposure to sun light.

10.5 Incompatible materials

Do not mix with acids, oxidisers, nitrite and nitrate salts.
Reacts violently with ammonia and sodium chromate.

10.6. Hazardous decomposition products

Hydrogen Cyanide (HCN)

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Hazard Class	Hazard category	Hazard statement	Reason for no classification
Acute toxicity - oral:			conclusive but not sufficient for classification
Acute toxicity - dermal:			conclusive but not sufficient for classification
Acute toxicity - inhalation:			data lacking
Skin corrosion / irritation:			conclusive but not sufficient for classification
Serious damage / eye irritation:			conclusive but not sufficient for classification
Respiratory sensitisation:			data lacking
Skin sensitisation:			conclusive but not sufficient for

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			classification
Aspiration hazard:			data lacking
Reproductive Toxicity:			conclusive but not sufficient for classification
Reproductive Toxicity: Effects on or via lactation:			data lacking
Germ cell mutagenicity:			conclusive but not sufficient for classification
Carcinogenicity:			conclusive but not sufficient for classification
Specific target organ toxicity – single exposure:			conclusive but not sufficient for classification
Specific target organ toxicity – repeated exposure:			conclusive but not sufficient for classification

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Compartment	Hazard conclusion	Remarks/Justification
Freshwater	no hazard identified: Intermittent releases:	For 2 trophic levels (fish and invertebrates), the short-term toxicity of the target's analogue sodium ferrocyanide has been determined and both the LC50 and EC50 values were > 100 mg/L, respectively. No adverse effects have been observed in the studies at the highest recommended test concentrations/doses with a substance of good water solubility. Therefore, no exposure assessment for that route of exposure is deemed necessary for potassium ferrocyanide and thus no PNECs are derived. **PNEC intermittent release hazard assessment conclusion:** PNEC aqua (intermittent releases) **PNEC intermittent release justification:** For 2 trophic levels (fish and invertebrates), the short-term toxicity of the target's analogue sodium ferrocyanide been determined and both the LC50 and EC50 values were > 100 mg/L, respectively. No adverse effects have been observed in the studies at the highest recommended test concentrations/doses with a substance of good water solubility. Therefore, no exposure assessment for that route of exposure is deemed necessary for potassium ferrocyanide and thus no PNECs are derived.
Marine water	no hazard identified:	For 2 trophic levels (fish and invertebrates), the short-term toxicity of the target's analogue sodium ferrocyanide been determined and both the LC50 and EC50 values

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	Intermittent releases:	were > 100 mg/L, respectively. No adverse effects have been observed in the studies at the highest recommended test concentrations/doses with a substance of good water solubility. Therefore, no exposure assessment for that route of exposure is deemed necessary for potassium ferrocyanide and thus no PNECs are derived.

Sediments (freshwater)	no hazard identified:	No adverse effects have been observed in 2 aqueous studies, based on read-across data from the target substance's analogue sodium ferrocyanide at the highest recommended test concentrations/doses with a substance of good water solubility. Therefore, no exposure assessment for that route of exposure is deemed necessary for potassium ferrocyanide and thus no PNECs are derived.
Sediments (marine water)	no hazard identified:	No adverse effects have been observed in 2 aqueous studies, based on read-across data from the target substance's analogue sodium ferrocyanide at the highest recommended test concentrations/doses with a substance of good water solubility. Therefore, no exposure assessment for that route of exposure is deemed necessary for potassium ferrocyanide and thus no PNECs are derived.
Sewage treatment plant	PNEC STP: 100mg/L	Assessment factor: 10 Extrapolation method: PNEC STP The NOEC for STP microorganisms was 1000 mg/L, based on read-across data from the target substance's analogue sodium ferrocyanide. To determine the PNEC, an assessment factor of 10 was applied to this concentration, resulting in a PNEC for STP of 100 mg/L.
Soil	no hazard identified:	No adverse effects have been observed in 2 aqueous studies, based on read-across data from the target substance's analogue sodium ferrocyanide at the highest recommended test concentrations/doses with a substance of good water solubility. Therefore, no exposure assessment for that route of exposure is deemed necessary for potassium ferrocyanide and thus no PNECs are derived.
Air	no hazard identified:	There is no data to derive a PNEC in air, and no regulatory requirement. Therefore, the PNEC air is not derived.
Secondary poisoning	no potential for bioaccumulation:	The substance is not classified as H373, H372, H360, H361 or H362 under the CLP Regulation, nor has it bioaccumulative potential or low biodegradability. Therefore, exposure assessment regarding secondary poisoning is not required and thus no PNECoral is derived.

Conclusion on environmental classification
Based on all available data, potassium ferrocyanide does not have to be classified for the (aquatic) environment as an acute (short-term) and long-term aquatic hazard according to the CLP Regulation (Regulation 1272/2008).

12.5 Results of PBT and vPvB assessment

Not relevant (inorganic substance)

13. DISPOSAL CONSIDERATIONS

Product/packing: Observe all federal, state and local environmental regulations.
See directives 75/442/EEC and 2006/12/EC.

14. TRANSPORT INFORMATION

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Not classified as hazardous goods.

15. REGULATORY INFORMATION

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

State regulations

Observe all federal, state and local regulations.

Water hazard class:

No additional information

additional regulations and restrictions:

REACh regulation

15.2 Chemical Safety report

A Chemical Safety Assessment has been carried out

16. OTHER INFORMATION

Consulted literature:	various
Version:	Nr. 3.00 of 25.05.2018. (Replaces all preceding versions.)
Changes per section compared to last version:	according to latest standard after REACH-registration
Name of composer and manager in charge:	Mr W. van Loon.
Printing date:	28-05-2018

Used abbreviations

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
IATA : International Air Transport Association
ICAO: International Civil Aviation Organization
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

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