

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY/UNDERTAKING**1.1 Product identifier:**

The trade name of the mixture: NANOFER 25S
REACH No.: A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

Relevant identified uses: for laboratory usage, for industrial usage, it is highly applicable in the reduction technologies of ground water remediation and waste water treatment.

1.3 Details of the supplier of the Safety Data Sheet

- **Supplier:** NANO IRON, s.r.o.
- **Street address:** Štefánikova 116
- **Country ID/Postcode/Place:** (CZ) Czech Republic/66461/Rajhrad
- **Telephone number/Fax:** +420 513 033 633/ +420 547 230 212
- **E-mail address:** info@nanoiron.cz
- **National contact:** +420 513 033 633
- **Identification number:** 28298055

1.4 Emergency telephone number: +420 224 919 293 or +420 224 915 402 (non-stop medical service), TIS Praha, Na Bojišti 1, 128 08 Prague 2. Czech Republic.

SECTION 2: HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]**

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

2.1.2. Classification according to Directive 67/548/EEC

Not a hazardous substance or mixture according to EC-directives 67/548/EEC or 1999/45/EC.

2.1.3 Additional information: none

2.2 Label elements

The product does not need to be labelled in accordance with EC directives or respective national laws.

Precautionary statement(s), P, in full

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/ face protection.

P305+P351+P338IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazards

None

2.3 Other hazards

In contact with water may release small amounts of explosive hydrogen gas (less than 1l/1kg.h).

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances: not applicable

3.2 Mixture:

Name :	CAS No. :	Weight % content	Classification according to 67/548/EEC	Classification according to Regulation (EC) No 1272/2008 (CLP).
Iron (Fe)	7439-89-6	(14-18)%	Iron is not classified as dangerous	Iron is not classified as dangerous
Magnetite (Fe ₃ O ₄)	1309-38-2	(6-2)%	Magnetite is not classified as dangerous	Magnetite is not classified as dangerous
Carbon (C)	7440-44-0	(0-1)%	Carbon is not classified as dangerous	Carbon is not classified as dangerous
Water (H ₂ O)	7732-18-5	77%	Water is not classified as dangerous	Water is not classified as dangerous
Surfactant	-	3%	-	-

Slurry of water, zero-valent iron nanoparticles and iron oxides.

SECTION 4: FIRST AID MEASURES**4.1 Description of first aid measures:**

- **Eye contact:** Rinse eyes with large amounts of low pressure water and get immediate medical attention.
- **Skin contact:** Wash affected area with soap and water, get medical attention if irritation develops.
- **Inhalation:** Move to fresh air and get immediate medical attention.

- **Ingestion:** Drink plenty of water and induce vomiting, get immediate medical attention.
- **Self-protection of the first aider:** It was found none.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 and section 11.

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES**5.1 Extinguishing media**

Suitable extinguishing media: Extinguishing powder or sand.

5.2 Special hazards arising from the substance or mixture

After drying of the mixture dried powder could be accumulated with heat by oxidation in air, but will not be exploded. Do not scatter the particles.

5.3 Advice for firefighters

Warning! Use black glasses during firefighting – the danger of blindness. The metals burns with a dazzling light which can damage the retina. The eye protection is required. The protective equipment must be chosen according to the fire greatness. Appropriate protective breathing mask with independent air supply and possibly full protective clothing. Cool by water the products in sealed containers which are near the fire. If possible, remove the products within undamaged containers from danger area. Contaminated extinguishing water must be stored separately, do not discharge it into the drains. The fire extinguishing water or used firefighting media with combustion residues must be disposed in accordance with relevant regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency****6.1.1 For non-emergency personnel**

- a) Avoid spreading of product. Wear of suitable protective equipment to prevent any contamination of skin, eyes and personal clothing. For personal protection see section 8. Avoid ingestion of product.
- b) Do not let the product come into contact with oxidizing agents, acids, acetylene and ammonia.

6.1.2 For emergency responders

Wear of suitable protective equipment to prevent any contamination of skin, eyes and personal clothing. For personal protection see section 8.

6.2 Environmental precaution

Prevent further leakage or spillage if safe to do so. Do not let product enter to drains without permission from local authority.

6.3 Methods and material for containment and cleaning up:

- 6.3.1 For containment: Cover with inert, absorbent material and remove to water-filled container (particles react with water to iron oxide form) and dispose as non-hazardous waste.
- 6.3.2 For cleaning up: Flush with plenty of water.
- 6.3.3 Other information: Spill area may be slippery.

6.4 Reference to other sections:

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE**7.1 Precautions for safe handling****7.1.1. Recommendations:**

- (a) Excess pressure to be let off by carefully opening the container before use. Never open the container at the temperature over 35°C. Ensure sufficient ventilation. Avoid sparks and other sources of ignition. Homogenize material and use the whole volume best. If unused material left, keep it sealed with inert gas (nitrogen, argon);
- (b) Do not mix with oxidizing agents, acids, acetylene, ammonia;
- (c) Do not allow the product conduction into drains, surface and ground water without permission from local authority.

7.1.2. Advice on general occupational hygiene:

- (a) Do not eat, drink and smoke during the manipulation with the product;
- (b) to wash hands after use; and
- (c) to remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities:

Store in a tightly sealed container in a cool (the most suitable temperatures are 1-5°C), dry and well-ventilated area. Material may degrade on storage unless refrigerated. Do not freeze!

7.3 Specific end use(s):

Part of the application mentioned in section 1.2 no other uses are reserved.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters: ACGIH TLV (1997) TWA 5mg/m³ as Fe

OSHA PEL (1994) TWA 10mg/m³ as Fe₂O₃

8.2 Exposure controls: Avoid eye and skin contact. Before breaks and after work wash your hands.

- (a) Eye/face protection Use of tightly fitted safety goggles (EN 166).

(b) Skin protection

Use appropriate protective gloves such as nitrile-rubber or butyl-rubber is recommended, minimum thickness of gloves 0.12 mm. Very appropriate is to use hand protective cream.

Use protective clothing with long sleeves, respectively safety proactive footwear (EN 344).

Environmental exposure controls

Do not allow the product conduction into drains, surface and ground water without permission from local authority.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**9.1 Information on basic physical and chemical properties**

a) Appearance:	liquid (nanomaterial)
- Color:	black
- Granulometry:	d50 < 50nm
- Specific surface:	> 25m ² /g
- Specific gravity:	1.15 – 1.25 g/cm ³ (20°C)
- Surface charge:	zero (0)
- Zeta potential:	not applicable
b) Odour:	no odour
c) Odour threshold:	no odour
d) pH:	11 -12
e) Melting point/freezing point:	not applicable
f) Boiling point and boiling range:	not applicable
g) Flash point:	not applicable
h) Evaporation rate:	not applicable
(i) Flammability (solid, gas):	not applicable
(j) Upper/lower flammability or explosive limits:	not applicable
(k) Vapour pressure:	not applicable
(l) Vapour density:	not applicable
(m) Relative density:	not applicable
(n) Solubility (ies):	mixture is possible to thin in water
(o) Partition coefficient: n-octanol/water:	not applicable
(p) Auto-ignition temperature:	not applicable
(q) Decomposition temperature:	not applicable
(r) Viscosity:	not applicable
(s) Explosive properties:	not applicable
(t) Oxidizing properties:	not applicable

9.2 Other information

No data available.

SECTION 10: STABILITY AND REACTIVITY**10.1 Reactivity**

With water - a small volume of hydrogen is generated in water reaction (less than 1l/1kg-hr);

10.2 Chemical stability

Stable under recommended storage conditions;

10.3 Possibility of hazardous reactions:

Not applicable

10.4 Conditions to avoid:

Avoid air, elevated temperatures, ignition sources;

10.5 Incompatible materials:

Oxidizing agents, acids;

10.6 Hazardous decomposition products

Other decomposition products - no data available

In case of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION**11.1 Information on toxicological effects**

• Acute toxicity:

Acute toxicity of the product components	Iron – dry powder (CAS No: 7439-89-6)			
LD ₅₀ , oral, sewer rat:	30 000 mg/kg	-	-	-
LD ₅₀ , dermal, sewer rat or rabbit:	Not tested	-	-	-
LC ₅₀ , inhalation, sewer rat, for aerosols or particles for 4 hours:	Not tested	-	-	-

• Skin corrosion/irritation: no data available

• Serious eye damage/irritation: no data available

SECTION 16: OTHER INFORMATION

All information, recommendations and suggestions appearing herein concerning NANO IRON, s.r.o. products are based upon tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity and suitability for his/her own use of the product described herein. Since the actual use by others is beyond NANO IRON, s.r.o. control, it make no guarantee, expressed or implied, as to the effects of such use, the results to be obtained or the safety and toxicity of the product: nor do it assume any liability arising out of use, by others, of the product referred to herein. The information herein is not to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.