SGS Report
No. SHAEC1825101001 Date: Aug. 6, 2019 Page 1 of 1

Pars Foulad Sabzevar (SPScoro)
Joveyn, Razavi Khorasan Province

SGS Ref. No. : SP18-037363-SH
Sample Name : Direct Reduced Iron (B), Pellets,
End Uses : Steel Ingots
Composition/Ingredient of sample (as per client submission) : See Section 3 Composition/information on ingredients on the SDS report
Job Receiving Date : Nov 11, 2018
Last Information Date : Jan 07, 2019
SDS Preparation Period : Nov 11, 2018 - Jan 11, 2019

Service Requested : Preparation of Safety Data Sheet (SDS) for the sample with submitted information.

Summary : As per request, the contents and formats of the SDS are prepared in accordance with European Commission Regulation (EC) No 1907/2006, Regulation (EC) No 1272/2008 and Regulation (EU) No 2015/830, and is provided per attached.

Signed for and on behalf of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Cathy Cai
Approved Signatory
SECTION 1: Identification of the substance/mixture and of the company/undertaking

- 1.1 Product identifier
  - Trade name: Direct Reduced Iron (DRI), Pellets,

- 1.2 Relevant identified uses of the substance or mixture and uses advised against
  - Application of the substance / the mixture: Steel Ingots

- 1.3 Details of the supplier of the safety data sheet
  - Manufacturer/Supplier:
    Pars Foulad Sabzevar (SPSco)
    Joveyn, Razavi Khorasan Province
    Tel: 051 4544 4205
    E-mail: sabzevarstein@gmail.com
  - Only Representative/other EU contact point: Not available
  - Further information obtainable from: Pars Foulad Sabzevar (SPSco)

- 1.4 Emergency telephone number:
  - Mostafa Mohiamamifar
  - Tel: +989155753813

UNITED KINGDOM
National Poisons Information Service
Tel: +44 (0) 344 892 0111 (for healthcare professional)
+44 (0) 845 46 46 47 (in England or Wales)
+44 (0) 8454 24 24 24 (in Scotland)

- 1.5 Reference Number: SP18-037363-SH; SHAEC1825101001

SECTION 2: Hazards identification

- 2.1 Classification of the substance or mixture
  - Classification according to Regulation (EC) No 1272/2008

  ![GHS07]
  Eye Irrit. 2 H319 Causes serious eye irritation.

- Information concerning particular hazards for human and environment:
  The product has to be labelled due to the calculation procedure of Regulation (EC) No. 1272/2008.

- Classification system:
  The classification is according to the latest edition of EU Regulation (EC) No. 1272/2008, and extended by company and literature data.

- 2.2 Label elements
  - Labelling according to Regulation (EC) No 1272/2008
  - The product is classified and labelled according to the CLP regulation.
  - Hazard pictograms

  ![GHS07]

- Signal word: Warning
  - Hazard-determining components of labelling: Not applicable.
  - Hazard statements
    H319 Causes serious eye irritation.
  - Precautionary statements
    P264 Wash thoroughly after handling.
    P280 Wear eye protection / face protection.
    P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
SECTION 3: Composition/information on ingredients

- 3.2 Mixtures
  - Description:
    Mixture of the substances listed below with nonhazardous additions.
    For the wording of the listed hazard statements refer to Section 16.

- Composition:

<table>
<thead>
<tr>
<th>CAS</th>
<th>EINECS</th>
<th>Name</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7439-89-6</td>
<td>231-096-4</td>
<td>iron</td>
<td>82.0%</td>
</tr>
<tr>
<td>1309-37-1</td>
<td>215-168-2</td>
<td>diiron trisodium</td>
<td>8.0%</td>
</tr>
<tr>
<td>7631-86-9</td>
<td>231-545-4</td>
<td>silicon dioxide</td>
<td>3.16%</td>
</tr>
<tr>
<td>1309-48-4</td>
<td>215-171-9</td>
<td>magnesium oxide</td>
<td>2.27%</td>
</tr>
<tr>
<td>7440-44-0</td>
<td>231-153-3</td>
<td>carbon</td>
<td>2.14%</td>
</tr>
<tr>
<td>1305-78-8</td>
<td>215-138-9</td>
<td>calcium oxide</td>
<td>1.05%</td>
</tr>
<tr>
<td>1344-28-1</td>
<td>215-691-6</td>
<td>aluminium oxide</td>
<td>0.98%</td>
</tr>
<tr>
<td>1313-13-9</td>
<td>215-202-6</td>
<td>manganese dioxide</td>
<td>0.2%</td>
</tr>
<tr>
<td>13463-67-7</td>
<td>236-675-5</td>
<td>titanium dioxide</td>
<td>0.08%</td>
</tr>
<tr>
<td>1314-62-1</td>
<td>215-239-8</td>
<td>divanadium pentaoxide</td>
<td>0.08%</td>
</tr>
<tr>
<td>7723-14-0</td>
<td>231-768-7</td>
<td>phosphorus</td>
<td>0.033%</td>
</tr>
<tr>
<td>7704-34-9</td>
<td>231-722-6</td>
<td>sulfur</td>
<td>0.007%</td>
</tr>
</tbody>
</table>

CAS: Chemical Abstracts Service Number
EINECS: European Inventory of Existing Commercial Chemical Substances

SECTION 4: First aid measures

- 4.1 Description of first aid measures
  - After inhalation: Remove person to fresh air. Get medical attention in case of breathing difficulty.
  - After skin contact:
    Wash gently and thoroughly with water and soap. Ensure contaminated clothing is washed before re-use or discard. If irritation develops seek medical attention.
  - After eye contact:
    If contact with eye(s) occurs wash with copious amount of water for approximately 15 minutes. If eye irritation develops and persists seek medical attention.
SECTION 5: Firefighting measures

- 5.1 Extinguishing media
  - Suitable extinguishing agents: Use fire extinguishing methods suitable to surrounding conditions.

- 5.2 Special hazards arising from the substance or mixture No further relevant information available.

- 5.3 Advice for firefighters
  - Protective equipment:
    - Wear fully protective suit.
    - Mouth respiratory protective device.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures
  - Avoid contact with eyes.
  - Avoid contact with skin.
  - Avoid formation of dust.
  - Ensure adequate ventilation.
  - Use respiratory protective device against the effects of fumes/dust/aerosol.

- 6.2 Environmental precautions: Do not allow to enter sewers/surface or ground water.

- 6.3 Methods and material for containment and cleaning up:
  - Pick up mechanically.
  - Dispose contaminated material as waste according to item 13.

- 6.4 Reference to other sections
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.

SECTION 7: Handling and storage

- 7.1 Precautions for safe handling
  - Avoid contact with eyes and skin.
  - Ensure good ventilation/exhaustion at the workplace.
  - Prevent formation of dust.
  - For the general occupational hygienic measures refer to Section 8.

- 7.2 Conditions for safe storage, including any incompatibilities
  - Requirements to be met by storerooms and receptacles: Store in a cool location.
  - Information about storage in one common storage facility:
    - Store away from foodstuffs.
    - Do not store together with acids.
    - Protect from moisture.

(Contd. on page 2)
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed receptacles.

7.3 Specific end use(s) No further relevant information available.

### SECTION 8: Exposure controls/personal protection

#### 8.1 Control parameters

**Ingredients with limit values that require monitoring at the workplace:**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Long-term value:</th>
<th><strong>mg/m³</strong></th>
<th>DFG, 2, Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGW (Germany)</td>
<td>Long-term value:</td>
<td>1.25* 10**</td>
<td>2(I); *alveologängig**einembar; AGS, DFG</td>
</tr>
<tr>
<td>VME (France)</td>
<td>Long-term value:</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>WEL (Great Britain)</td>
<td>Short-term value:</td>
<td>10*</td>
<td>Long-term value: 5* 10** 4*** mg/m³</td>
</tr>
<tr>
<td></td>
<td><em>(as Fe)</em></td>
<td><em>(as Mg)</em></td>
<td>*inhalable dust, fume and respirable dust</td>
</tr>
<tr>
<td>AGW (Germany)</td>
<td>Long-term value:</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>VME (France)</td>
<td>Long-term value:</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>WEL (Great Britain)</td>
<td>Long-term value:</td>
<td>10* 4**</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(as Mg)</em></td>
<td>*inhalable dust, fume and respirable dust</td>
<td></td>
</tr>
<tr>
<td>AGW (Germany)</td>
<td>Long-term value:</td>
<td>1.25* 10**</td>
<td>2(I); *alveologängig**einembar; AGS, DFG</td>
</tr>
<tr>
<td>VME (France)</td>
<td>Long-term value:</td>
<td>2*</td>
<td></td>
</tr>
<tr>
<td>WEL (Great Britain)</td>
<td>Long-term value:</td>
<td>2*</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(as Mg)</em></td>
<td>*inhalable dust, fume and respirable dust</td>
<td></td>
</tr>
<tr>
<td>AGW (Germany)</td>
<td>Long-term value:</td>
<td>1.25* 10**</td>
<td>2(I); *alveologängig**einembar; AGS, DFG</td>
</tr>
<tr>
<td>VME (France)</td>
<td>Long-term value:</td>
<td>4*</td>
<td></td>
</tr>
<tr>
<td>WEL (Great Britain)</td>
<td>Long-term value:</td>
<td>2*</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(as Mg)</em></td>
<td>*inhalable dust, fume and respirable dust</td>
<td></td>
</tr>
<tr>
<td>AGW (Germany)</td>
<td>Long-term value:</td>
<td>1.25* 10**</td>
<td>2(I); *alveologängig**einembar; AGS, DFG</td>
</tr>
<tr>
<td>VME (France)</td>
<td>Long-term value:</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>WEL (Great Britain)</td>
<td>Long-term value:</td>
<td>10* 4**</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(as Mg)</em></td>
<td>*inhalable dust, fume and respirable dust</td>
<td></td>
</tr>
<tr>
<td>AGW (Germany)</td>
<td>Long-term value:</td>
<td>0.2* 0.05**</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(as Mn)</em></td>
<td>*inhalable, fume and respirable dust</td>
<td></td>
</tr>
</tbody>
</table>

*(Contd. of page 5)*
### AGW (Germany) 
**Long-term value:** 0.02A; 0.2E mg/m³  
8(II); DFG, Y, 10, 20

### WEL (Great Britain) 
**Long-term value:** 2 * 0.05** mg/m³  
as Mn **inhalable fraction** **respirable fraction**

### 13463-67-7 titanium dioxide (0.08%) 
**AGW (Germany)** 
**Long-term value:** 1.25 * 10** mg/m³  
2(II); *alveolengängig** einatembar; AGS, DFG

**VME (France)** 
**Long-term value:** 10 mg/m³

**WEL (Great Britain)** 
**Long-term value:** 10 * 4** mg/m³  
*total inhalable **respirable*

### 1314-62-1 divanadium pentoxide (0.08%) 
**AGW (Germany)** 
**Long-term value:** 0.005A; 0.030E mg/m³  
1(II); AGS, Y, 10, 21

**VME (France)** 
**Long-term value:** 0.05 mg/m³  
(2) (9) (10)

**WEL (Great Britain)** 
**Long-term value:** 0.05 mg/m³

### 7723-14-0 phosphorus (0.033%) 
**AGW (Germany)** 
**Long-term value:** 0.01 E mg/m³  
2(II); AGS, Y

**VME (France)** 
**Short-term value:** 0.3 mg/m³  
**Long-term value:** 0.1 mg/m³

**WEL (Great Britain)** 
**Short-term value:** 0.3 mg/m³  
**Long-term value:** 0.1 mg/m³

### Regulatory information 
- AGW (Germany): TRGS 900  
- VME (France): ED 984, 10.2016  
- WEL (Great Britain): EH40/2018  
- IOELV (EU): (EU) 2017/164

- **DNELEX:** Data not available.  
- **PNECs:** Data not available.

### Ingredients with biological limit values: 
#### 1313-13-9 manganese dioxide 
**BGW (Germany)** 
20 µg/l  
Untersuchungsmaterial: Vollblut  
Probennahmezeitpunkt: bei Langzeiteexposition: am Schichtende nach mehreren  
vorangegangenen Schichten, Expositionsende bzw. Schichtende  
Parameter: Mangan

#### 1314-62-1 divanadium pentoxide 
**BGW (Germany)** 
70 µg/g Kreatinin  
Untersuchungsmaterial: Urin  
Probennahmezeitpunkt: bei Langzeiteexposition: am Schichtende nach mehreren  
vorangegangenen Schichten, Expositionsende bzw. Schichtende  
Parameter: Vanadium

### Additional information: 
The lists valid during the making were used as basis.

- **8.2 Exposure controls**
  - Based on the composition shown in Section 3, the following measures are suggested for occupational safety measure
  - Appropriate engineering controls  
    - Keep away from foodstuffs, beverages and feed.  
    - Immediately remove all soiled and contaminated clothing.  
    - Wash hands before breaks and at the end of work.  
    - Avoid contact with the eyes and skin.
See Section 7 for information about design of technical facilities.

- **Personal protective equipment**
  - **Respiratory protection:**
    During handling dust is generated and respiratory protection of EN 149:2001 may be used.

- **Protection of hands:**

  ![Protective gloves]

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

  Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

- **Material of gloves:**
  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

- **Penetration time of glove material:**
  The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**

  ![Tightly sealed gogglies]

- **Environmental exposure controls:**
  Control measures must be made in accordance with Community environmental protection legislation.

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## SECTION 9: Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**

  - **General Information**
  - **Appearance:**
    - **Form:** Solid
    - **Colour:** Light grey
    - **Odour:** Odourless
    - **Odour threshold:** Data not available.
  - **pH-value:** Not applicable.
  - **Change in condition:**
    - **Melting point/freezing point:** 1,530 °C
    - **Initial boiling point and boiling range:** 2,860 °C
  - **Flash point:** Not applicable.
  - **Flammability (solid, gas):** Data not available.
  - **Auto-ignition temperature:** >125 °C
  - **Decomposition temperature:** Data not available.
  - **Self-igniting:** Product is not selfigniting.
  - **Explosive properties:** Product does not present an explosion hazard.
  - **Explosion limits**
    - **Lower:** Not applicable.

(Contd. on page 7)
Trade name: Direct Reduced Iron (B), Pellets.

Upper:
- Oxidizing properties: Not applicable.
- Vapour pressure: Not applicable.
- Density: 1.8±0.1 g/cm³
- Relative density: Not applicable.
- Vapour density: Not applicable.
- Evaporation rate: Not applicable.
- Solubility in water: Insoluble.
- Partition coefficient: n-octanol/water: Not applicable.
- Viscosity:
  - Dynamic: Not applicable.
  - Kinematic: Not applicable.
- 9.2 Other information: No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity
When wet, oxidizes with fresh water and more readily with sea water forming rust and generation of Hydrogen Gas.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
No dangerous reactions known.

10.4 Conditions to avoid
Temperature above 65 °C Contact with acid, open flame and water.

10.5 Incompatible materials: water, air, Oxygen, CO2, H2

10.6 Hazardous decomposition products:
Product is porous iron which rusts in the presence of water and air. Rusting creates heat which may cause large piles to heat up and ignite. Hydrogen gas also is liberated from wet product. If piles become hot, separate into small piles and flood with water.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
- Acute toxicity: Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:

7438-89-6 iron
Oral LD50 30,000 mg/kg (rat)
1309-37-1 ditron trioxide
Oral LD50 >5,000 mg/kg (rat)
7631-86-9 silicon dioxide
Oral LD50 10,000 mg/kg (rat)
1344-28-1 aluminium oxide
Oral LD50 >5,000 mg/kg (rat)
13463-67-7 titanium dioxide
Oral LD50 >20,000 mg/kg (rat)
Dermal LD50 >10,000 mg/kg (rabbit)
Inhalative LC50/4 h >6.82 mg/l (rat)

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

(Contd. on page 8)
Trade name: Direct Reduced Iron (B), Pellets.

- **Serious eye damage/irritation**
  Causes serious eye irritation.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

(Contd. of page 7)

**SECTION 12: Ecological information**

- **12.1 Toxicity**
  - **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **12.5 Results of PBT and vPvB assessment**
  - **PBT:** Not applicable.
  - **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.
- **12.7 Additional ecological information:**
  - **General notes:**
    Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

**SECTION 13: Disposal considerations**

- **13.1 Waste treatment methods**
- **Recommendation:**
  Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging**
  - **Recommendation:** Disposal must be made according to official regulations.

**SECTION 14: Transport information**

- **14.1 UN-Number**
  - ADR/RID/ADN, IMDG, IATA Not applicable.
- **14.2 UN proper shipping name**
  - ADR/RID/ADN, IMDG, IATA Not applicable.
- **14.3 Transport hazard class(es)**
  - ADR/RID/ADN, IMDG, IATA
    - **Class** Not applicable.
    - **Label** Not applicable.
- **14.4 Packing group**
  - ADR/RID/ADN, IMDG, IATA Not applicable.
- **14.5 Environmental hazards**
  Not applicable.

(Contd. on page 9)
SECTION 15: Regulatory information

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

- MAK(German Maximum Workplace Concentration)
  - 1344-28-1 aluminium oxide 2
  - 13463-67-7 titanium dioxide 3A
  - 1314-62-1 diuranium pentaoxide 2

- Directive 2012/18/EU
- Named dangerous substances - ANNEX I None of the ingredients is listed.
- National regulations:
  - Waterhazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.

- Other regulations, limitations and prohibitive regulations
  - SVHC Candidate List of REACH Regulation Annex XIV Authorisation (27/6/2018)
    None of the ingredients is listed.

- REACH Regulation Annex XVII Restriction (10/10/2018)
  See Section 16 for information about restriction of use.
  None of the ingredients is listed.

- REACH Regulation Annex XIV Authorisation List (13/6/2017)
  None of the ingredients is listed.

- 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

- Relevant hazard statements
  H228 Flammable solid.
  H302 Harmful if swallowed.
  H315 Causes skin irritation.
  H318 Causes serious eye damage.
  H332 Harmful if inhaled.
  H335 May cause respiratory irritation.
  H341 Suspected of causing genetic defects.
  H361d Suspected of damaging the unborn child.
  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.

- Classification according to Regulation (EC) No 1272/2008
  Serious eye damage/eye irritation
  The classification of the mixture is generally based on the calculation method using substance data according to Regulation (EC) No 1272/2008.


DISCLAIMER OF LIABILITY:
The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions (Contd. on page 10)
or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

evPvB: very Persistent and very Bioaccumulative

Flam. Sol. 1: Flammable solids – Category 1

Acute Tox. 4: Acute toxicity – Category 4

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

Muta. 2: Germ cell mutagenicity – Category 2

Repr. 2: Reproductive toxicity – Category 2

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard – Category 3

End of document