FERROCHROME (FeCr)

Ferrochrome is not classified as hazardous under the CLP Regulation (1272/2008/EC) or as dangerous under the Dangerous Substances Directive (67/548/EEC), is not persistent bio accumulative and toxic (PBT) or very persistent and very bio accumulative (vPvB) as defined in Annex XIII of the REACH Regulation, and is not included in the ECHA candidate list of substances of very high concern.

Therefore provision of a Safety Data Sheet (SDS) according to Regulation 453/2010 is not mandatory. This Product Safety Information (PIS) is a voluntary presentation of certain information that may assist the user in the handling of Ferrochrome.

1 IDENTIFICATION OF SUBSTANCE AND COMPANY

1.1 Product Identifier
- Ferrochrome (FeCr)
- High Carbon Ferrochrome (HFeCr)
- Charge Chrome

Reach Reference No

<table>
<thead>
<tr>
<th>Substance</th>
<th>Reach Reference No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium</td>
<td>01-2119485652-31-0009</td>
</tr>
<tr>
<td>Iron</td>
<td>01-2119462838-24-0052</td>
</tr>
</tbody>
</table>

CAS number

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrochrome</td>
<td>11114-46-8</td>
</tr>
</tbody>
</table>

1.2 Relevant identified uses of the substance and uses advised against
This product is used as raw material for the manufacture of various grades of stainless steel, high chromium casting, and special steel.

No uses advised against.

1.3 Details of supplier/ manufacturer
Vargön Alloys AB
468 80 Vargön
www.vargonalloys.se
+46 521 277 300

1.3.1 Name of contact person
Evalotta Stolt
Environment and Quality manager
+46 521 27 73 37

1.4 Emergency telephone number
Call your local emergency hotline.
112 is the emergency number throughout Europe.
HAZARDS IDENTIFICATION

2.1 Classification of the substance
This product does not meet the criteria for hazard classification requirements of the current European legislation on classification and labelling that are applicable for substances.

2.2 Label elements
This product is not hazardous. Labelling is not required.

2.3 Other Hazards

2.3.1 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 or respiratory protective equipment.
Use appropriate protective equipment; eye-protection and gloves when handling the material directly and suitable respiratory protection where dust occurs.

2.3.2 During use
Fumes may be produced during the melting operations. Chromium may be present in these fumes in oxidized forms, some of which may be hazardous. See guidance on safe use.

COMPOSITION INFORMATION ON INGREDIENTS

3.1 Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Nr</th>
<th>EINECS/ELINCS</th>
<th>Amount (%)</th>
<th>Symbol</th>
<th>R-Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium (metallic)</td>
<td>7440-47-3</td>
<td>231-157-5</td>
<td>50 -70%</td>
<td>Cr</td>
<td>None</td>
</tr>
<tr>
<td>Iron (metallic)</td>
<td>7439-89-6</td>
<td>231-096-4</td>
<td>20-30%</td>
<td>Fe</td>
<td>None</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>231-153-3</td>
<td>4-9%</td>
<td>C</td>
<td>None</td>
</tr>
<tr>
<td>Silicon</td>
<td>7440-21-3</td>
<td>231-130-8</td>
<td>1-6%</td>
<td>Si</td>
<td>None</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>231-111-4</td>
<td>0.1-0.5%</td>
<td>Ni</td>
<td>None at this concentration range</td>
</tr>
</tbody>
</table>

Other Components:
Remaining components of this product are proprietary, non-hazardous and/or are present at concentrations below reportable limits.

Additional Information:
Amounts indicated are typical and do not represent a specification.
4  FIRST AID MEASURES

4.1 Description of first aid measures
Move the person to fresh air - if respiratory problem persists, seek medical attention.

4.1.1 Inhalation
If mechanical irritation is caused by dust in the airways move the person to fresh air - if respiratory problem persists, seek medical attention.

4.1.2 Skin contact
Wash skin with water and soap.

4.1.3 Eye contact
If mechanical irritation is caused by dust in the eyes, rinse eyes with plenty of water to remove dust. Seek medical attention if discomfort persists. Do not rub the eyes.

4.2 Most important symptoms and effects, both acute and delayed
This product is considered as non-hazardous.

4.3 Indication of any immediate medical attention and special treatment needed
No relevant information has been identified.

5  FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Ferrochrome is not combustible.

5.2 Special hazards arising from the substance or mixture
Ferrochrome is not combustible.

5.3 Advice for fire-fighters
Ferrochrome is not combustible.

6  ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Eye protection and respirators should be worn were dust is a potential hazard. Gloves should be worn when handling this material because of the risk of contact with sharp particles.

6.2 Environmental precautions
There are no special procedures for this material. Dispose in a way approved by the competent local authorities. Dry material can normally be re-used.
6.3 Methods and material for containment and cleaning up
Collect spillage in a closed container. Avoid excessive dust generation. Material may be reclaimed for re-use.

7 HANDLING AND STORAGE

7.1 Precautions for safe handling
The product is a heavy and dense material. Avoid generation of dust. Protective equipment, gloves and goggles, should be worn when handling the material. Suitable respiratory protection should be worn where dust occurs.

7.2 Conditions for safe storage, including any incompatibilities
The product is stable in storage and should be kept dry. If not protected from weathering, a slight tarnishing may occur to the surface of the material, which is non-toxic and does not in any way detract from the properties and quality of the material.

7.3 Specific end use(s)
See section 1.2 above.

8 EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control parameters

8.1.1 National limit values
Users must always consult their national or regional regulatory authorities for advice on the current legal limits applicable to them. They should further check whether these limits are legally binding or only recommended guidelines.

Frequently used limit values for inhalable dust in Europe is
- eight hours 10 mg/m$^3$
- short term 20 mg/m$^3$ (Austria, Denmark and Germany)

National limit values for Sweden (AFS 2005:17)

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS-nr</th>
<th>Limit value - NGV (8 hours)</th>
<th>Short term limit value - KTV (15 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust, total</td>
<td>-</td>
<td>10 mg/m$^3$</td>
<td>-</td>
</tr>
<tr>
<td>Dust, respirable</td>
<td>-</td>
<td>5 mg/m$^3$</td>
<td>-</td>
</tr>
</tbody>
</table>

8.1.2 DNEL and PNEC

<table>
<thead>
<tr>
<th>Substance</th>
<th>DNEL (Derived No Effect Level)</th>
<th>PNEC (Predict No Effect Concentration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium</td>
<td>0.5 mg Cr / m$^3$</td>
<td>4.7 µg / l Cr (III)</td>
</tr>
</tbody>
</table>
8.2 National Exposure controls

8.2.1 Appropriate engineering controls
Use local exhaust ventilation for dusty operations.

8.2.2 Individual protection measures, such as personal protective equipment
Always wash the hands after finishing work.

8.2.3 Eye/face protection
Goggles / face shield if dust is a hazard

8.2.4 Skin
Long sleeves overalls; gloves for hands, where applicable

8.2.5 Respiratory
If exposure is above the Occupational Health limits, suitable respiratory protection equipment approved by national authorities should be used.

8.2.6 Thermal hazards
Not identified.

8.2.7 Environmental exposure controls
Do not wash spilled materials into drainage system, material may block drains. The limit values for particles (PM 2.5 and PM 10) of the Ambient Air Directive 1999/30/EC and its further amendments have to be implemented.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Metallic silver grey lumps, chips or fine material</td>
</tr>
<tr>
<td>Odour</td>
<td>No odour</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not applicable as there is no odour</td>
</tr>
<tr>
<td>pH</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Melting point</td>
<td>&gt;1500 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>2700°C – 3000 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Relative density</td>
<td>6 – 9 ton /m^3</td>
</tr>
</tbody>
</table>
9.2 Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk density</td>
<td>3.2 – 3.7 ton/m³</td>
</tr>
</tbody>
</table>

10 STABILITY AND REACTIVITY

10.1 Reactivity

The product does not contain reactive functionalities.

10.2 Chemical stability

The product is chemically stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possible hazardous reactions

Ferrochrome can react with some acids with the evolution of hydrogen.

Ferrochrome can react with molten alkalis with the formation of compounds containing chromium (VI).

It is known that high temperature processes including production and welding of chromium and chromium-containing alloys can lead to generation of fumes containing chromium (VI). Although the precise identity of the chromium (VI) substances generated has not been identified it is important to recognize that several substances containing chromium (VI) have been classified as carcinogenic, mutagenic, toxic for reproduction and dangerous for the environment. It is therefore essential that workplace and releases to the environment associated with these activities are monitored to ensure compliance with national and/or Community legislative limits. The European Confederation of Iron and Steel Industries (Eurofer), the European Association of Metals (Eurometaux) and the European Welding Association (EWA) jointly developed Safe Use Recommendations for welding metals and alloys, compiled in a document that is available for REACH purposes (www.eurofer.be).

10.4 Conditions to avoid

Once molten, ferrochrome produces fumes. Dust suspended in air could cause dust explosions.

10.5 Incompatible materials

Ferrochrome can react with some acids with the evolution of hydrogen.

Ferrochrome can react with molten alkalis resulting in the formation of compounds containing chromium (VI) - see 10.3 above.
10.6 Hazardous decomposition products
See section 10.3 and 10.5

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>acute toxicity</td>
<td>No acute toxicity</td>
</tr>
<tr>
<td>b</td>
<td>skin corrosion/irritation</td>
<td>Not corrosive or irritant</td>
</tr>
<tr>
<td>c</td>
<td>serious eye damage/irritation</td>
<td>Typical of a nuisance dust</td>
</tr>
<tr>
<td>d</td>
<td>respiratory or skin sensitization</td>
<td>Not sensitizing</td>
</tr>
<tr>
<td>e</td>
<td>germ cell mutagenicity</td>
<td>Not mutagenic</td>
</tr>
<tr>
<td>f</td>
<td>carcinogenicity</td>
<td>Not carcinogenic</td>
</tr>
<tr>
<td>g</td>
<td>reproductive toxicity</td>
<td>Not toxic for reproduction</td>
</tr>
<tr>
<td>h</td>
<td>STOT-single exposure</td>
<td>No STOT single exposure</td>
</tr>
<tr>
<td>i</td>
<td>STOT-repeated exposure</td>
<td>No STOT repeated exposure</td>
</tr>
<tr>
<td>j</td>
<td>aspiration hazard</td>
<td>No aspiration hazard</td>
</tr>
</tbody>
</table>

Precautionary notes:
During melting, pickling and welding stages (strongly oxidizing conditions), water soluble hexavalent chromium and oxides of metals may be present in the effluent fumes. Suitable precautions should be taken to minimize exposure of personnel to such fumes. See section 10.3 above.
Any moisture in the material should be regarded as an explosion hazard if it is to be used in high temperature.

12 ECOLOGICAL INFORMATION

12.1 Toxicity
Based on available data, the environmental hazard classification criteria are not met.

12.2 Persistence and degradability
Ferrochrome is an inorganic substance and is not biodegradable. The solubility in water is considered low.

12.3 Bio accumulative potential
No or very low potential for bio concentration and bioaccumulation.

12.4 Mobility in soil
Ferrochrome is immobile in soil and sediment. Dissolved silica (and silicon) and all the metals within Ferrochrome are poorly volatile substances and partition predominantly in the aquatic or soil or sediment compartments.
12.5 Results of PBT and vPvB assessment
Ferrochrome is an inorganic material and it is not classifiable as a PBT/vPvB substance. Ferrochrome is not known to contain any >0,1 % or any <0,1 % PBT/vPvB impurities.

13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Disposal of waste should be undertaken by a licensed waste contractor in accordance with appropriate national and local regulations.

14 TRANSPORTATION INFORMATION
The material is not classified as hazardous for transport (ADR, RID, UN, IMO, IATA/ICAO).

15 REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This Product Safety Information is prepared in compliance with
- Commission decision 2000/53 of 3 May 2000 establishing a list of waste pursuant (European List of Wastes)
- Directive 2008/50/EC on ambient air quality and cleaner air in Europe.

15.2 Chemical Safety Assessment
No chemical safety assessment has been carried out because the substance is not classified as hazardous.

16 OTHER INFORMATION
Other references:
- FeCr Chemical Safety Report
- ECHA 2012 Guidance on the compilation of safety data sheets

Additional advice on specific questions can be obtained from Vargön Alloys AB