* * *Section 1 – Identification* * *

Product Identifier: Pig Iron
Chemical Family: Alloy
Recommended Use: Manufacturing of steel and ferrous castings
Restriction on Use: None identified

Manufacturer Information

The David J. Joseph Company
300 Pike Street
Cincinnati, OH 45202

Non-Emergency Contact: Safety Department
Non-Emergency Phone: 513-419-6200
Emergency Contact: DJJ
Emergency Phone: 513-562-1699

* * *Section 2 – Hazard(s) Identification

Classification

This substance is not classified as a dangerous substance according to the European 67/548/EEC Directive and the Regulation (EC) No 1272/2008.

GHS Label Elements

Symbol(s)

N/A

Signal Word

N/A

Hazards Statement(s)

The Principle risk to human health presented by iron dust is related to the concentration of dust in the air acting as a nuisance dust. The higher the concentration of dust, the greater the risk of irritation to the respiratory system and mechanical irritation to the eyes.

Precautionary Statements

Avoid the generation of dust.

* * *Section 3 – Composition / Information on Ingredients* * *

CAS	Component	Percent
7439-89-6	Iron	> 80%
7440-44-0	Carbon	< 6%
7440-21-3	Silicon	< 5%
7439-96-5	Manganese	< 2%
7723-14-0	Phosphorus	< 2%
7704-34-9	Sulphur	< 0.4%

* * *Section 4 – Fist Aid Measures* * *

Inhalation

Move the victim away from the contaminated area, taking all necessary precautions, and make him rest. In the event of unconsciousness, put the victim on his side in the recovery position and seek medical attention. In the event of respiratory disorders, provide respiratory assistance and seek medical attention.

Skin Contact

Possible burns from molten iron or hot work. If burns occur, wash immediately with plenty of water and seek immediate medical attention.

Eye Contact

Wash immediately with plenty of water. Consult a specialist in the event of disorders.

Ingestion

Do not provoke vomiting. Rinse the victim's mouth if they are conscious. Seek medical attention.

* * *Section 5 – Fire Fighting Measures* * *

Extinguishing Media

Powder, foam, CO2.

Unsuitable Extinguishing Media

Water.

Specific Hazards Arising from the Chemical

Molten iron may react violently with water. Avoid molten iron coming into contact with water and do not allow water to become trapped under molten iron. Sudden, violent release of steam and gases can occur when water is trapped under molten iron.

Special Protective Equipment and Precautions for Firefighters

Wear a self-contained breathing apparatus with a full face piece operated in pressure-demand or positive-pressure mode and full protective clothing. Do not breathe vapors and move upwind of fumes.

* * *Section 6 – Accidental Release Measures* * *

Personal Precautions, Protective Equipment and Emergency Procedures

Not applicable for solid pig iron.

For spills involving molten iron, personnel should be protected against contact with eyes and skin and avoid inhalation of dust and fumes.

Methods and Materials for Containment and Cleaning Up

Fine, dry, cool materials should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Collect materials in appropriate, labelled containers for recovery or disposal in accordance with local regulations. Where possible, iron should be recycled for further use. In the event that recycling is not possible, material should be disposed of in an appropriately permitted landfill site or by other means, always in compliance with applicable regulations.

* * *Section 7 – Handling and Storage* * *

Precautions for Safe Handling

The transportation/handling movement of molten iron should be carried out using suitable and approved refractory lined containers. Some products in the solid form may be secured by straps or bands. These should not be used for lifting as they could cause eye or other injury when tension is released.. Al products are likely to have sharp edges, which could cause lacerations, and flying particles may be produced when shearing.

Conditions for Safe Storage

Suitable storage areas should be clearly marked and storage containers should be fit for purpose.

Incompatibilities

Molten iron may react violently with water. Avoid molten iron coming into contact with water and do not allow water to become trapped under molten iron.

* * *Section 8 – Exposure Controls / Personal Protection* * *

Exposure Limits

ACGIH

Substance	TWA (mg/m3)	ST or C (mg/m3)
Dust	-	10(I)-3(R)
Fe2O3	5(R)	-
Manganese	0.2	-
Silicon	10 (withdrawn in 2006)	-
Amorphous silica (SiO2)	2(R) (withdrawn in 2006)	-
Phosphorus as P2O5	-	-
Carbon Monoxide	29	-
Carbon Dioxide	9150	-
Sulphur Dioxide	2	5 NIC: 0.25 ppm

OSHA

Substance	P-TWA	P-C
Dust	15-5(R)	-
Fe2O3	10 (Fume)	-
Manganese	-	5 (fume and compounds)
Silicon	15-5(R)	-
Amorphous Silica (SiO2)	-	-
Phosphorous P2O5	-	-
Carbon Monoxide	55	-
Carbon Dioxide	9000	-
Sulphur Dioxide	13	-

DNEL for workers

Long term-local effects-Inhalation: 3 mg/m3

Appropriate Engineering controls

When fume or dust is generated, provide adequate general ventilation to ensure exposure limits are not exceeded. If necessary, provide local fume extraction, with the correct capture hood and capture velocity to match the conditions.

Provide safety showers and an eye wash station.

Individual Protection Measures

Eyes/Face Protection

Solid: During handling, dust may be generated and the use of safety glasses is recommended.
Liquid: The use of full face protection is required. Contact lenses should not be worn where industrial exposures to this material are likely.

Skin Protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved. For liquid iron, molten metal protection clothing is required.

Hand Protection

Solid: Use of canvas gloves is advisable.
Liquid: The use of protective gloves (aluminised-molten) is required.

Respiratory Protection

Solid: During handling, dust may be generated and if ventilation is inadequate, the use of an FFP2 (EN 149:2001) type respirator is recommended.
Liquid: When there is a risk of exposure to fume from hot metal, use of a P3 dust mask (to EN 149:2001, FFP3S) may be appropriate, provided that a tight face seal is achieved and demonstrated by achieving a pass in a face fit test.

* * *Section 9 – Physical and Chemical Properties* * *

Appearance: Molten liquid or solid iron

Physical state: Liquid or solid
Melting Point: 1150 to 1538 C
Flash Point: N/A
UFL: N/A
Vapor Pressure: N/A
Specific Gravity: N/A
Auto Ignition: None

pH: N/A
Boiling Point: 2861 C at 101,325 hPa
OSHA Flammability Class: Non-flammable
LFL: N/A
Relative Density: ~7.80 g/cm3
Solubility (H20): Insoluble

* * *Section 10 – Chemical Stability & Reactivity* * *

Reactivity

Reactive with oxidizing agents, acids. Chlorine trifluoride reacts with iron with incandescence.

Chemical Stability

Solid: The product is stable under normal conditions, but when subjected to elevated temperatures, fumes are produced.
Liquid: Molten iron is stable under normal storage and handling conditions.

Possibility of Hazardous Reaction

None identified.

Conditions to Avoid

Liquid form: Contact with water.

Incompatible Materials

Solid: Avoid contact with acids.
Liquid: Encapsulating water within molten iron may cause an explosion.

Hazardous Decomposition Products

Thermal oxidative decomposition can produce fumes containing, for example, oxides of iron and manganese as well as other elements. May produce toxic iron fumes when heated to decomposition (1535 C).

* * *Section 11 – Toxicological Information* * *

Acute Dose Effects

Inhalation

Risk of irritation to the respiratory system. Chronic inhalation of excessive concentrations of fumes or dusts may result in the development of a benign pneumoconiosis.

Ingestion

None.

Skin

Risk of mechanical irritation.

Eye

Mechanical irritation to the eyes.

Acute Toxicity

Oral

LD50 7500 mg/kg bw: No acute oral toxicity.

Dermal

Due to lack of systemic exposure after dermal exposure of the skin, no acute toxicity is to be expected and thus no classification is needed.

Inhalation

Discriminating conc.: 250 mg/m3 air: No acute inhalation toxicity.

Sensitization

Not sensitizing.

Delayed Effects

Chronic Oral

LOAEL: 26 mg/kg bw/day (sub-chronic; rat) Target organs: digestive: pancreas; digestive: liver; cardiovascular / hematological: heart.

Chronic Inhalation

NOAEC: 5 mg/m3 (sub-acute; rat) Target organs: respiratory: lung.

Mutagenicity

No effect.

Irritation/Corrosivity Data

Not irritating.

* * *Section 12 – Ecological Information* * *

Ecotoxicity

This substance is not classified dangerous according to the European 67/548/EEC Directive and the Regulation (EC) No 1272/2008.

Persistence & Degradability

For an inorganic substance, biotic degredation in the environment is irrelevant for the purposes of persistence and degradability.

Bioaccumulation

Iron and its compounds are essential substances. Iron is an essential trace element, well regulated in all living organisms. The available evidence shows the absence of iron biomagnification across the trophic food chain both in the aquatic and terrestrial food chains. The existing information suggests not only that iron does not biomagnify, but rather that it tends to exhibit biodilution.

Mobility

Iron and its compounds are found in the form of hydroxides in the environment. They are established in the form of oxides in the long term.

PBT and vPvB Assessment

As iron is not bio-available, owing to its extreme insolubility in water, it is not systematically available or bio-accumulative and hence it does not fulfill either of the PBT or vPvB criteria for classification.

* * *Section 13 – Disposal Considerations* * *

Disposal Methods

Iron should always be recycled, never landfilled.

Disposal of Contaminated Packaging

Destruction of packaging in accordance with applicable regulations.

* * *Section 14 – Transportation Information* * *

UN Number

UN 3257

UN Proper Shipping Name

Elevated temperature liquid transported (molten metals) N.O.S.

Transport Hazard Class

Class: 9

Classification Code: M9

Packing Group

Group: 3

Labels: 9

Special Provisions: 274, 580, 643

* * *Section 15 – Regulatory Information* * *

U.S. Federal Regulations

No additional regulations.

* * *Section 16 – Other Information* * *

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

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