Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **FERROSILICON 30-90%**

Other name(s): FESI 45/50; FESI 75/80; Ferro silicon LA.

Recommended Use of the Chemical and Restrictions on Use Additive to liquid metal in foundries for production of cast iron.

Supplier: Ixom Operations Pty Ltd (Incorporated in Australia)
NZBN: 9429041465226
Street Address: 166 Totara Street
Mt Maunganui South
New Zealand

Telephone Number: +64 9 368 2700
Facsimile: +64 9 368 2710
Emergency Telephone: **0 800 734 607 (ALL HOURS)**

Please ensure you refer to the limitations of this Safety Data Sheet as set out in the "Other Information" section at the end of this Data Sheet.

2. HAZARDS IDENTIFICATION

Classified as a Dangerous Good according to NZS 5433:2012 Transport of Dangerous Goods on Land.

Classified as hazardous according to criteria in the Hazardous Substances (Minimum Degrees of Hazard) Notice 2017 and the Hazardous Substances (Classification) Notice 2017.

SIGNAL WORD: WARNING

Subclasses:
Subclass 4.3 Category C (low hazard) - Substances Dangerous when Wet.
Subclass 6.1 Category E - Substances which are acutely toxic.

Approval Number: HSR001276

Hazard Statement(s):
H261 In contact with water releases flammable gases.
H303 May be harmful if swallowed.

Precautionary Statement(s):

Prevention:
P102 Keep out of reach of children.
P231+P232 Handle under inert gas. Protect from moisture.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P370+P378 In case of fire: Use extinguishing media as outlined in Section 5 of this Safety Data Sheet for extinction.

Storage:
P402+P404 Store in a dry place. Store in a closed container.

Disposal:
P501 In case of a substance that is in compliance with a HSNO approval other than a Part 6A (Group Standards) approval, a label must provide a description of one or more appropriate and achievable methods for the disposal of a substance in accordance with the Hazardous Substances (Disposal) Notice 2017. This may also include any method of disposal that must be avoided.

Other Hazards:
Contact with water liberates toxic gas.
Contact with acids liberates very toxic gas.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Hazard Codes
Ferrosilicon with >30% silicon	8049-17-0	30-<90%	H261
Other component(s)	-	to 100%	-

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor.

Inhalation:
Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:
If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.

Eye Contact:
If in eyes, wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion:
Rinse mouth with water. If swallowed, give a glass of water to drink. If vomiting occurs give further water. Seek medical advice.

Indication of immediate medical attention and special treatment needed:
Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:
Dry agent (carbon dioxide, dry chemical powder). Dry sand.

Unsuitable Extinguishing Media:
Water jet, water fog.

Hazchem or Emergency Action Code: 4Y

Specific hazards arising from the chemical:
Substance emits flammable gases when in contact with water.

Special protective equipment and precautions for fire-fighters:
Lump material is not combustible. When suspended in air, dust of iron-silicon alloys can be readily ignited. On burning will emit toxic fumes. The degree of combustibility in air is dependent upon particle size and quantity of dispersion, with hazard increasing with particle fineness. Avoid generating sparks or ignition sources in areas of high airborne dust levels or in areas with accumulated dust.

On contact with water emits flammable and toxic gases including hydrogen, phosphine and arsine. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:
Shut off all possible sources of ignition. Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Personal precautions/Protective equipment/Methods and materials for containment and cleaning up:
Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. Work up wind or increase ventilation. Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers. Use non-sparking tools. DO NOT spray with water.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation. May form flammable dust clouds in air. For precautions necessary refer to Safety Data Sheet "Dust Explosion Hazards". Take precautionary measures against static discharges. Apply inert atmosphere (eg. N2) during crushing.

Conditions for safe storage, including any incompatibilities: Store in a cool, dry, well ventilated place. Keep dry - reacts with water, may lead to drum rupture. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for spills.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Workplace Exposure Standards: No value assigned for this specific material by the New Zealand Workplace Health & Safety Authority. However, Workplace Exposure Standard(s) for particulates and decomposition product(s):

Particulates not otherwise classified: 8hr WES-TWA 10 mg/m^3 (inhalable dust) or 3 mg/m^3 (respirable dust)
Arsine: WES-TWA 0.05 ppm, 0.16 mg/m^3
Phosphine: WES-TWA 0.3 ppm, 0.42 mg/m^3; WES-STEL 1 ppm, 1.4 mg/m^3

As published by the New Zealand Workplace Health & Safety Authority.

WES - TWA (Workplace Exposure Standard - Time Weighted Average) - The eight-hour, time-weighted average exposure standard is designed to protect the worker from the effects of long-term exposure.

WES - STEL (Workplace Exposure Standard - Short Term Exposure Limits) - The 15 minute average exposure standard. Applies to any 15 minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both short-term and eight-hour, time-weighted average exposures should be determined.

These Workplace Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These workplace exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Appropriate engineering controls:
Ensure ventilation is adequate to maintain air concentrations below Workplace Exposure Standards. Keep containers closed when not in use.

If in the handling and application of this material, safe exposure levels could be exceeded, the use of engineering controls such as local exhaust ventilation must be considered and the results documented. If achieving safe exposure levels does not require engineering controls, then a detailed and documented risk assessment using the relevant Personal Protective Equipment (PPE) (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

Individual protection measures, such as Personal Protective Equipment (PPE):
The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, DUST MASK.

Wear overalls, safety glasses and impervious gloves. Avoid generating and inhaling dusts. If determined by a risk assessment an inhalation risk exists, wear a dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Solid
Colour:	Black or Grey
Odour:	Odourless
Solubility:	Reacts with water.
Specific Gravity:	2.5-7.3
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available

Flash Point (°C):	Not applicable
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	>400
Melting Point/Range (°C):	1220-1400
pH:	Not applicable

10. STABILITY AND REACTIVITY

Reactivity: Reacts with water.

Chemical stability: No information available.

Possibility of hazardous reactions: Highly flammable hydrogen gas and the highly flammable and toxic gases phosphine and arsine may be formed if the product gets in contact with moisture, acids, or bases. A reaction with hydrofluoric acid or nitric acid leads to the formation of toxic gases such as silicon tetrafluoride or nitrous gases. Wet product will form highly flammable hydrogen gas if added to molten metal, due to decomposition of water. Addition of wet material to molten metal may cause explosions. Dust explosion hazard.

Conditions to avoid: Avoid exposure to moisture. Avoid exposure to humidity. Avoid dust generation.

Incompatible materials: Incompatible with water , acids , bases .

Hazardous decomposition products: Hydrogen gas if wetted.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion: Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain.

Eye contact: May be an eye irritant. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.

Skin contact: Contact with skin may result in irritation.

Inhalation: Breathing in dust may result in respiratory irritation. The vapour or smoke generated on contact with water, acids or alkalis is highly toxic. Breathing in high concentrations may result in headache, vomiting, irritation to the respiratory tract and central nervous system effects.

Acute toxicity: No LD50 data available for the product. However, for the major constituent:
Dermal LD50 (rabbit): >20000 mg/kg.

Respiratory or skin sensitisation: No information available.

Chronic effects: Not listed as carcinogenic according to the International Agency for Research on Cancer (IARC).

Aspiration hazard: No information available.

12. ECOLOGICAL INFORMATION

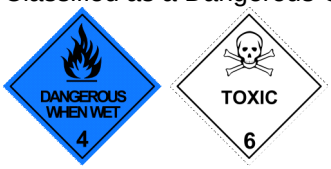
Ecotoxicity	Avoid contaminating waterways.
Persistence/degradability:	No information available.
Bioaccumulative potential:	No information available.
Mobility in soil:	No information available.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to local government authority for disposal recommendations. Dispose of contents/container in accordance with local/regional/national/international regulations.

14. TRANSPORT INFORMATION

Road and Rail Transport
Classified as a Dangerous Good according to NZS 5433:2012 Transport of Dangerous Goods on Land.



UN No:	1408
Transport Hazard Class:	4.3 Dangerous When Wet
Subrisk 1:	6.1 Toxic
Packing Group:	III
Proper Shipping Name or Technical Name:	FERROSILICON
Hazchem or Emergency Action Code:	4Y

Marine Transport
Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No:	1408
Transport Hazard Class:	4.3 Dangerous When Wet
Subrisk 1:	6.1 Toxic
Packing Group:	III
Proper Shipping Name or Technical Name:	FERROSILICON
IMDG EMS Fire:	F-G
IMDG EMS Spill:	S-N

Air Transport
Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	1408
Transport Hazard Class:	4.3 Dangerous When Wet
Subrisk 1:	6.1 Toxic
Packing Group:	III

Proper Shipping Name or Technical Name: FERROSILICON

15. REGULATORY INFORMATION

Classification:
Classified as hazardous according to criteria in the Hazardous Substances (Minimum Degrees of Hazard) Notice 2017 and the Hazardous Substances (Classification) Notice 2017.

Subclasses:
Subclass 4.3 Category C (low hazard) - Substances Dangerous when Wet.
Subclass 6.1 Category E - Substances which are acutely toxic.

Approval Number: HSR001276

Hazard Statement(s):
H261 In contact with water releases flammable gases.
H303 May be harmful if swallowed.

16. OTHER INFORMATION

Supplier Safety Data Sheet; 10/ 2017.

Reason(s) for Issue:
5 Yearly Revised Primary SDS

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Ixom Operations Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Ixom representative or Ixom Operations Pty Ltd at the contact details on page 1.

Ixom Operations Pty Ltd's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.