

*****Section 1 – Identification*******Product Identifier:** Ferromolybdenum**Chemical Family:** Ferro alloy**Recommended Use:** Scrap metal uses**Restriction on Use:** None known**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****GHS Label Elements****Symbol(s)****Signal Word**

Danger

Hazards Statement(s)

May cause irritation to eye, skin and respiratory tract

Avoid breathing dust.

Avoid contact with eyes, skin and clothing.

Keep container closed.

Wash thoroughly after handling.

Use only with adequate ventilation.

Precautionary Statements**Prevention**

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Use of personal protective equipment as required.

Response

Wash hands and face thoroughly with soap and water after handling prior to eating or drinking.

If exposed or concerned, seek medical advice/attention.

In case of eye contact, flush eyes with water for at least 15 minutes and call a physician.

Storage

None

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

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

CAS	Component	Percent
7439-98-7	Molybdenum	62
7439-89-6	Iron	37

*****Section 4 – First Aid Measures*******Inhalation**

Remove patient from exposure and bring to fresh air. If breathing has stopped, perform artificial respiration and seek medical attention immediately.

Skin Contact

Remove contaminated clothing and shoes. Wash skin with soap and water, rinse thoroughly until no evidence of chemical remains (15-20 minutes recommended). Seek medical attention.

Eye Contact

Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower eyelids until no evidence of chemical remains (15-20 minutes recommended). Seek medical attention.

Ingestion

Seek medical attention. If vomiting occurs, keep head lower than hips to prevent aspiration.

*****Section 5 – Fire Fighting Measures*******Extinguishing Media**

Use standard extinguishing media such as water, sand, foam. Use fire-fighting measures that suit the location/surroundings.

Unsuitable Extinguishing Media

None.

Specific Hazards Arising from the Chemical

Thermal decomposition may release toxic and/or hazardous gas.

Special Protective Equipment and Precautions for Firefighters

Wear self-contained breathing apparatus and fully protective suit and gloves. Dispose of fire debris and contaminated fire-fighting media in accordance with local regulations. If using water, contain the run-off if possible.

*****Section 6 – Accidental Release Measures*******Personal Precautions, Protective Equipment and Emergency Procedures**

Avoid formation and inhalation of dust. Seek to ensure ventilation that maintains airborne concentrations below Occupational Exposure Limits. Keep unprotected persons away. Although the substance has no acute toxicity, it is advised to avoid contact with skin, eyes, and clothing – wear suitable protective equipment.



Methods and Materials for Containment and Cleaning Up

Use an appropriate industrial vacuum cleaner, equipped with ULPS or HEPA filters. Collect spilled material in suitable containers or bags for recovery or disposal. In the case of disposal, spilled material should be disposed of as a waste as described in section 13.

Section 7 – Handling and Storage

Precautions for Safe Handling

The use of gloves and other protective clothing and equipment to avoid skin contact is suggested for all workplaces.

Conditions for Safe Storage

Store in well ventilated, dry area.

Incompatibilities

None.

Section 8 – Exposure Controls / Personal Protection

Exposure Limits

Substance	Type of Limit	Value	Form
Molybdenum	OSHA TWA	10mg/m3	Total Dust
Iron	OSHA TWA	10mg/m3	Total Particulate

Appropriate Engineering controls

Use process enclosures, local exhaust ventilation or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment if high dust/air concentrations are possible.

Individual Protection Measures

Use protective equipment as needed.

Eyes/Face Protection

Wear splash-proof or dust resistant safety goggles where there is danger of eye contact.

Skin Protection

Wear appropriate gloves and protective clothing to prevent repeated or prolonged contact with skin.

General Information

Prevent releases and contain spills.

Section 9 – Physical and Chemical Properties

Appearance: Silver-grey alloy of various sizes and shapes

Physical state: Solid

Melting/freezing Point: 3,000 F

Flash Point: N/A

UFL: Not Explosive

Vapor Pressure: N/A

Specific Gravity: No Information

Auto Ignition: N/A

pH: N/A

Boiling Point: 1155 deg C @ 760 mmHg

OSHA Flammability Class: No Information

LFL: Not Explosive

Vapor Density: N/A

Solubility (H20): Insoluble



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

Reactivity

Stable under normal temperatures and pressures.

Chemical Stability

Stable at normal conditions.

Possibility of Hazardous Reaction

Hazardous polymerization has not been reported.

Conditions to Avoid

Prevent dispersion of dust in air.

Incompatible Materials

Lithium.

Hazardous Decomposition Products

Thermal decomposition products may include oxides of iron and molybdenum.

*****Section 11 – Toxicological Information*****

General Toxicological Information

Ferromolybdenum is not a hazard classified substance. It is practically insoluble and chemically inert. Toxicological studies on ferromolybdenum itself are not available. The two main constituents, molybdenum and iron, are not classified as hazardous. Ferromolybdenum is not considered to be of concern regarding toxicological effects.

Molybdenum

Likely routes of Exposure	<p>Molybdenum is an essential element. Any molybdenum which dissolves and is taken up by the human body and exists predominantly in the form of the molybdate ion (MoO₄)²⁻.</p> <p>Oral Absorption Rapid and almost complete absorption through GI tract.</p> <p>Inhalation Absorption Well absorbed based on animal data. Absorption in humans dependent on particle size, deposition and clearance.</p> <p>Dermal Absorption Low to negligible.</p> <p>Metabolism No metabolism. Molybdenum compounds transform quickly to molybdate ions (MoO₄)²⁻ upon dissolution.</p> <p>Excretion Rapidly eliminated from plasma predominantly via renal excretion (>80%) and feces (<10%).</p>
Acute Toxicity	<p>Acute oral toxicity of molybdenum metal: LD₅₀, oral rat > 2000 mg/kg bw</p> <p>Regarding acute inhalation and dermal toxicity, studies are not available for molybdenum metal itself, but for several other molybdenum compounds covering a range of soluble and poorly soluble molybdenum substances and also different chemical forms (oxides, salts). All tested molybdenum substances show a very low order of toxicity. To avoid unnecessary testing, read-across is applied to molybdenum metal, which is also considered to be non-toxic following acute exposure via the oral, dermal or inhalation route:</p> <p>Estimated LD₅₀ dermal >2000 mg/kg bw Estimated LD₅₀ inhalation (4h) > 5 g/m³</p>
Skin Corrosion/Irritation	<p>Not irritating or corrosive to the skin.</p>



Serious Eye Damage/ Irritation	Not irritating or corrosive to the eyes.
Respiratory or Skin Sensitization	Molybdenum metal is not sensitizing to the skin. There is no data indicating respiratory sensitization.
Germ-Cell Mutagenicity	Not a germ cell mutagen. Negative test results in three tests with sodium molybdate for: bacterial reverse mutation assay, in vitro gene mutation assay in mouse lymphoma cells. Conservative read-across to the poorly soluble molybdenum metal.
Carcinogenicity	Not a carcinogen. (Read across for absence of systemic carcinogenicity, based on chronic toxicity and carcinogenicity studies with molybdenum trioxide. Local effects in the lung observed in these molybdenum trioxide studies are specific to molybdenum trioxide and not read-across to the poorly soluble molybdenum metal.
Reproductive Toxicity	There are currently no reliable scientific data available indicating adverse effects on reproduction or fertility.
STOT-Single Exposure	There are no specific target organ effects after single exposure to molybdenum.
STOT-Repeated Exposure	No reliable scientific data available indicating adverse effects after repeated exposure to molybdenum substances.
Aspiration Hazard	N/A

Iron

Likely routes of Exposure	Iron dust can act as a nuisance dust. Higher concentration in the air leads to higher risk of irritation. Inhalation Risk of inhalation of fine particles into the respiratory system. Ingestion Not applicable as it is. Skin Not applicable as is. Eyes Risk of fine particles in contact with eyes.
Acute Toxicity	Acute Toxicity Oral LD50, 7500 mg/kg bw Acute Toxicity Dermal N/R Acute Toxicity Inhalation Discriminating Concentration: 250 mg/m3 air
Skin Corrosion/ Irritation	Not Irritating.
Serious Eye Damage/ Irritation	Not irritating.
Respiratory or Skin Sensitization	Not Sensitizing.
Repeated Dose Toxicity: Sub-Acute/ Sub-Chronic/ Chronic Oral	LDLO: 26 mg/kg bw/day (subchronic; rat) Target Organs: pancreas, liver, heart.
Repeated dose Toxicity: Sub-Acute/ Sub-Chronic/ Chronic Inhalation	No observed adverse effect concentration: 5 mg/m3 Target Organs: lungs.

*****Section 12 – Ecological Information*******Component Analysis – Ecotoxicity – Aquatic Toxicity**

Ferromolybdenum is not hazardous to the aquatic environment itself.

Iron

Iron is one of the most ubiquitous elements in the environment and there is no eco-toxicity data available.

Molybdenum

Molybdenum in its soluble form, molybdate, can have effects on biomass growth, reproduction, population growth rate and malformation during development on certain aquatic species.

Persistence & Degradability

For an inorganic substance, biotic degradation in the environment is not a relevant process. The fraction of molybdenum metal that will be dissolved when released into the environment will be present as the molybdate species under normal environmental conditions.

Bioaccumulation**Iron**

Iron and its compounds are essential compounds. Iron is an essential trace element and is well regulated in all living organisms. Information suggests that not only does iron not biomagnify, it tends to exhibit biodilution.

Molybdenum

Bioaccumulation is not significant in aquatic or terrestrial environments.

Mobility**Iron**

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

Molybdenum

The molybdate ion is soluble in water, leachable through normal soil and mobile in sediment.

*****Section 13 – Disposal Considerations*******Disposal Methods**

Observe all federal, state and local regulations when disposing of this substance.

*****Section 14 – Transportation Information*******US DOT Information**

Ferromolybdenum is not considered dangerous for transport.

*****Section 15 – Regulatory Information*******U.S. Federal Regulations**

Ferromolybdenum is not an ozone-depleting substance and not a persistent organic pollutant.



*** * *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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