Safety Data Sheet (SDS)

GHS Rev. 03

SECTION 1 – CHEMICAL IDENTIFICATION

1.1 Product Names: Molybdenum Products
Other Identifiers: "Molybdenum metal", "Mo", "Moly metal powder", "Moly metal parts"

1.2 Product Use: Used in alloying metal in the form of ferromolybdenum for manufacturing special steels, in non-ferrous alloys and in colloidal form.

1.3 Supplier:
Elmet Technologies, LLC
1560 Lisbon Street
Lewiston, Maine 04222
(207) 333-6210

1.4 Emergency Telephone # 207-333-6100

SECTION 2 – HAZARDS IDENTIFICATION

2.1 GHS Classification
Eye Irritation, Category 2B
Organ Damage, Category 2

2.2 GHS Signal Word
WARNING

2.3 GHS Hazard Statements
H320 – Causes eye irritation.
H373 – May cause damage to organs through prolonged or repeated exposure.

2.3 GHS Precautionary Prevention Statements
P264 – Wash hands thoroughly after handling.
P260 – Do not breathe dust/fumes.

2.3 GHS Precautionary Response Statements
P305 – **IF IN EYES**:
Rinse cautiously with water for several minutes. Remove contact lenses if easy to do so. Continue rinsing. Get medical advice if eye irritation persists.

2.4 GHS Precautionary Storage Statements
N/A

2.5 GHS Precautionary Disposal Statements
P501 – Dispose of contents/containers in accordance with local, state and federal regulation.

SECTION 3 – CHEMICAL COMPOSITION/INGREDIENTS

3.1 Chemical Composition:

Molybdenum	CAS No. 7439-98-7	99-100%

SECTION 4 – FIRST AID MEASURES

4.1 Inhalation:
If excessive dust is inhaled, remove exposed person from source to fresh air. If irritation or discomfort persists seek medical attention.
Ingestion:
Immediately give a glass of water. First aid is not generally required. If in doubt, contact a poison information center or a physician.
Skin contact:
Brush material off skin. If excessive skin or hair contact occurs, wash affected area with soap and water. Seek medical attention in event of irritation.
Eye contact:
Immediately flush eyes with water for at least 15 minutes. Remove contact lenses if easy to do so. Occasionally lift the upper and lower eyelids to ensure complete irrigation. If pain persists seek medical attention.

Note: Long term exposure to high dust concentrations may cause changes in lung function (i.e. (pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung.

SECTION 5 – FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media:
Metal dust fires should be smothered with sand or inert dry powders. Do not use water, CO_2 or Foam. Use dry sand, graphite powder, dry sodium chloride based extinguishers to smother fire. Applying water to product fire may produce flammable and explosive hydrogen gas in poorly ventilated spaces. Chemical reaction with CO_2 may produce methane. If extinguishing is not possible, allow fire to burn out.

5.2 Firefighting Procedures:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Cool fire exposed containers with water from a safe distance. Remove containers from path of fire if easy to do so.

5.3 Unusual Fire/Explosion Hazards:
Metal powders may burn when metal is finely divided. Do not use water or foam as explosive hydrogen gas may result. Powders may be ignited by heat, sparks, friction or flame. Metal powders will burn with intense heat. Do not disturb burning dust as a potential explosion may result under certain conditions. Containers may explode on heating. Gases generated in fire may be irritating, corrosive or poisonous.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions:
Minor releases: Wear personal protective equipment as specified in Section 8. Avoid generating and breathing dust. Avoid contact with skin and eyes. Eliminate all sources of ignition. Vacuum with intrinsically-safe equipment or sweep up.

Major releases: Clear personnel from area. Responders should wear air supplied breathing apparatus and protective gloves. Use dry cleanup methods and avoid generating dust. Recover uncontaminated product in clean, dry, labeled containers.

6.2 Environmental Precautions:
Prevent spills from entering surface waters, storm sewers or drains.

SECTION 7 – HANDLING AND STORAGE

7.1 Precautions for Safe Handling:
Avoid generating and breathing dust. Provide adequate ventilation if dust is created. Avoid breathing dust or fumes. Avoid contact with eyes and skin. Avoid sources of heat and ignition sources. Wash thoroughly before eating or using tobacco products. See Section 8 for personal protective equipment information.

7.2 Conditions for Safe Storage:
Store in a cool, dry, ventilated area. Store materials away from heat or ignition sources. Separate from strong oxidizing agents, bromine trifluoride, chlorine trifluoride, lead dioxide, fluorine, nitric acid and sulfuric acid.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 Exposure Limits:

CHEMICAL & CAS NO.	OSHA PEL	ACGIH TLV
Molybdenum (7439-98-7) As Mo Insoluble Compounds	15 mg/m^3 TWA (total dust) 5 mg/m^3 TWA (resp. dust)	10 mg/m^3 TWA (inhalable dust)

8.2 Engineering Controls:
Fine metal dusts must be collected at the source of generation as they are potentially explosive. Molybdenum metal powder is potentially a reactive finely divided metal similar in hazard to aluminum, zinc, magnesium or titanium. A system of local and/or general exhaust is recommended to keep employee exposures below airborne exposure limits. Bag or filter-type collectors should be mounted away from work areas and designed with explosion relief doors.

8.3 Personal Protective Equipment:
Respiratory Protection:
If the exposure limit is exceeded and engineering controls are not feasible, a NIOSH-approved respirator designed to properly protect employees from known airborne contaminant concentrations shall be used. For emergencies or instances where the exposure levels are not known, a full face-piece positive-pressure air supplied respirator shall be used.
WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Eye Protection:
Safety glasses with side shields or goggles as required.
Skin Protection:
Chemical-resistant gloves and clothing are recommended to minimize skin contact.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Dark gray or black solid or divided solid with a metallic luster.
Odor: Odorless
pH: N/A
Melting point/freezing point: 4,752 °F (2,622 °C)
Boiling point: 8717 °F (4,825 °C)
Flash point: N/A
Evaporation rate: N/A
Flammability: N/A
LEL (%): N/A
UEL (%): N/A
Vapor pressure (kPa): 1.3 @ 3,535 °C
Vapor density: N/A
Specific gravity (water = 1): 10.28
Solubility in water: Immiscible
Auto-ignition temperature: 680 °F (360 °C) for 0-74 micron dusts.

SECTION 10 – STABILITY AND REACTIVITY

10.1 Stability:
Stable under normal conditions of use and storage however powder or dust in fine size may ignite during intensive mechanical treatment or excessive heat.

10.2 Possibility of Hazardous Reactions and Conditions to Avoid
Heat, sunlight, incompatibles, sources of ignition. Hydrogen gas may form upon contact with certain acids and bases.

10.3 Incompatibility (materials to avoid):
Strong oxidizers. Separate from strong oxidizing agents, bromine trifluoride, chlorine trifluoride, lead dioxide, fluorine, nitric acid and sulfuric acid.

10.4 Hazardous Decomposition Products:
Heat produces trioxide or hex carbonyl hydroxide.

10.5 Hazardous Polymerization:
Will not occur.

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 Emergency Overview:
Warning. Causes eye irritation. May cause damage to organs through prolonged or repeated exposure.

11.2 Potential Health Effects:
Inhalation: Persons with impaired respiratory function may incur further disability if excessive concentrations of particulate are inhaled. Molybdenum fumes may produce bronchial irritation and moderate fatty changes in the liver and kidneys.

Ingestion: Not thought to produce harmful effects however may be damaging to individuals with preexisting organ damage (liver, kidneys) is evident. Ingestion of insignificant quantities not thought to be cause of concern.
Eye Contact: Direct contact with the eye may cause discomfort (tearing, redness) and abrasive eye inflammation.
Skin Contact: Not thought to produce adverse health effects or skin irritation.
Aggravation of Pre-existing Conditions: Persons with pre-existing eye disorders or impaired respiratory functions may be more susceptible to the effects of this material.

11.3 Acute Toxicity Values:

Oral LD_{50} (Rat) = 7mg/kg/2 week intermittent
Inhalation LC_{50} (Rat) = 70mg/kg

11.4 NTP Carcinogenicity:

Ingredient	Known	Anticipated	IARC Category
Molybdenum (7439-98-7)	No	No	None

SECTION 12 – ECOLOGICAL INFORMATION

12.1 Environmental Fate:
No data available.

12.2 Environmental Toxicity:
No data available.

12.3 Persistence and Degradability:
No data available.

12.4 Mobility in Soil:
No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Collect contaminated waste, place in sealed containers, and dispose in accordance with local, state and federal regulations.

SECTION 14 – TRANSPORT INFORMATION

14.1 U.S. Department of Transportation (DOT)
Not regulated for transport by DOT.

SECTION 15 – REGULATORY INFORMATION

15.1 US Federal Regulations

RCRA: This product does not contain ingredients that could enable it to become a hazardous waste as defined by 40 CFR 260.10 if the product is discarded.
Clean Air Act: This product does not contain ingredients indentified as Hazardous Air Pollutants in CAA Section 112(b).
Safe Drinking Water Act: This product does not contain ingredients for which there are secondary Maximum Concentration Limits established.
Clean Water Act: This product does not contain compounds identified in 40 CFR 116.4
EPCRA, SARA Title III, Section 313: Chemical not subject to reporting requirements.
CERCLA: Reporting for releases of this product to the environment is not required.
DOT: See section 14.
TSCA: This product is listed on the US Toxic Substances Control Act (TSCA) Inventory.

SECTION 16 – OTHER INFORMATION

16.1 National Fire Protection Association (NFPA) Ratings:

This information is intended solely for the use of individuals trained in the NFPA system.
Health: 1
Flammability: 0
Reactivity: 0
Revision Indicator: New SDS
Disclaimer: The information contained herein is accurate to the best of our knowledge. Elmet Technologies, LLC makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.