



SAFETY DATA SHEET

MATERION

1. Identification

Product identifier Molybdenum Product

Other means of identification
SDS number 133

Manufacturer/Importer/Supplier/Distributor information
Manufacturer

Company name Materion Advanced Materials Group
Address 42 Mt. Ebo Road South
Brewster, NY 10509
United States

Telephone 1+845.279.0900
Website materion.com
E-mail Not available.

Emergency phone number Chemtrec 1+703.527.3887

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Specific target organ toxicity, single exposure Category 3 respiratory tract irritation

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Hazard symbol None.

Signal word None.

Hazard statement Not available.

Precautionary statement

Prevention Not available.

Response Not available.

Storage Not available.

Disposal Not available.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Substances

| Chemical name | Common name and synonyms | CAS number | % |
|---------------|--------------------------|------------|-----------|
| Molybdenum | | 7439-98-7 | 100 - 100 |

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Rinse skin with water/shower. Get medical attention if irritation develops and persists.

Eye contact Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.

Most important symptoms/effects, acute and delayed Dusts may irritate the respiratory tract, skin and eyes.

5. Fire-fighting measures

Suitable extinguishing media Not available.
Unsuitable extinguishing media Not available.
Specific hazards arising from the chemical Not applicable.
Special protective equipment and precautions for firefighters Not available.
Fire fighting equipment/instructions Use water spray to cool unopened containers.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up.

Methods and materials for containment and cleaning up The product is immiscible with water and will spread on the water surface. Stop the flow of material, if this is without risk. Collect dust using a vacuum cleaner equipped with HEPA filter.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Avoid the generation of dusts during clean-up. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid prolonged exposure. Practice good housekeeping.

Conditions for safe storage, including any incompatibilities Store in original tightly closed container. Store in a well-ventilated place.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

| Material | Type | Value | Form |
|--------------------|------|----------------------|-------------|
| Molybdenum Product | PEL | 15 mg/m ³ | Total dust. |
| Components | Type | Value | Form |

| | | | |
|----------------------------|-----|----------------------|-------------|
| Molybdenum (CAS 7439-98-7) | PEL | 15 mg/m ³ | Total dust. |
|----------------------------|-----|----------------------|-------------|

US. ACGIH Threshold Limit Values

| Material | Type | Value | Form |
|----------------------------|------|----------------------|----------------------|
| Molybdenum Product | TWA | 3 mg/m ³ | Respirable fraction. |
| | | 10 mg/m ³ | Inhalable fraction. |
| Components | Type | Value | Form |
| Molybdenum (CAS 7439-98-7) | TWA | 3 mg/m ³ | Respirable fraction. |
| | | 10 mg/m ³ | Inhalable fraction. |

US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants

| Material | Type | Value | Form |
|----------------------------|------|----------|----------------------|
| Molybdenum Product | PEL | 3 mg/m3 | Respirable fraction. |
| | | 10 mg/m3 | Total dust. |
| Components | Type | Value | Form |
| Molybdenum (CAS 7439-98-7) | PEL | 3 mg/m3 | Respirable fraction. |
| | | 10 mg/m3 | Total dust. |

| | |
|--|---|
| Biological limit values | No biological exposure limits noted for the ingredient(s). |
| Appropriate engineering controls | Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. |
| Individual protection measures, such as personal protective equipment | |
| Eye/face protection | Wear safety glasses with side shields (or goggles). |
| Skin protection | |
| Hand protection | Not normally needed. |
| Other | Wear suitable protective clothing. |
| Respiratory protection | Wear respirator with dust filter. |
| Thermal hazards | Not available. |
| General hygiene considerations | Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. |

9. Physical and chemical properties

Appearance

| | |
|---|---------------------------------|
| Physical state | Solid. |
| Form | Powder. |
| Color | Not available. |
| Odor | Not available. |
| Odor threshold | Not available. |
| pH | Not available. |
| Melting point/freezing point | 4751.6 °F (2622 °C) |
| Initial boiling point and boiling range | 8382.2 °F (4639 °C) |
| Flash point | Not available. |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not available. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | Not available. |
| Flammability limit - upper (%) | Not available. |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - upper (%) | Not available. |
| Vapor pressure | < 0.0000001 kPa (77 °F (25 °C)) |

| | |
|---|----------------|
| Vapor density | Not available. |
| Relative density | Not available. |
| Solubility(ies) | |
| Solubility (water) | Insoluble |
| Partition coefficient (n-octanol/water) | Not available. |
| Auto-ignition temperature | Not available. |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |

Other information

| | |
|-------------------|-----------------------------------|
| Density | 10.28 g/cm ³ estimated |
| Molecular formula | Mo |
| Molecular weight | 95.94 g/mol |
| Specific gravity | 10.28 |

10. Stability and reactivity

| | |
|------------------------------------|--|
| Reactivity | Not available. |
| Chemical stability | Material is stable under normal conditions. |
| Possibility of hazardous reactions | Not available. |
| Conditions to avoid | Contact with incompatible materials. |
| Incompatible materials | Strong oxidizing agents. |
| Hazardous decomposition products | No hazardous decomposition products are known. |

11. Toxicological information

Information on likely routes of exposure

| | |
|--------------|---------------------------------------|
| Inhalation | Dust may irritate respiratory system. |
| Skin contact | Dust or powder may irritate the skin. |
| Eye contact | Dust may irritate the eyes. |
| Ingestion | Not available. |

Symptoms related to the physical, chemical and toxicological characteristics
Dusts may irritate the respiratory tract, skin and eyes.

Information on toxicological effects

| | |
|-----------------------------------|----------------|
| Acute toxicity | Not available. |
| Skin corrosion/irritation | Not available. |
| Serious eye damage/eye irritation | Not available. |
| Respiratory or skin sensitization | |
| Respiratory sensitization | Not available. |
| Skin sensitization | Not available. |
| Germ cell mutagenicity | Not available. |

Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

| | |
|---|--------------------------------------|
| Reproductive toxicity | Not available. |
| Specific target organ toxicity - single exposure | Not available. |
| Specific target organ toxicity - repeated exposure | Not available. |
| Aspiration hazard | Not available. |
| Chronic effects | Prolonged inhalation may be harmful. |

12. Ecological information

Ecotoxicity

| Product | Species | Test Results |
|--------------------|--|--------------------|
| Molybdenum Product | | |
| Aquatic | | |
| Fish | LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss) | 800 mg/l, 96 hours |

* Estimates for product may be based on additional component data not shown.

| | |
|--------------------------------------|----------------|
| Persistence and degradability | Not available. |
| Bioaccumulative potential | Not available. |
| Mobility in soil | Not available. |
| Other adverse effects | Not available. |

13. Disposal considerations

| | |
|--|--|
| Disposal instructions | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. |
| Local disposal regulations | Dispose in accordance with all applicable regulations. |
| Hazardous waste code | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| Waste from residues / unused products | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory information

US federal regulations

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)**SARA 302 Extremely hazardous substance**

Not listed.

SARA 311/312 Hazardous chemical

No (Exempt)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

US state regulations**California Proposition 65**

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Molybdenum (CAS 7439-98-7)

16. Other information, including date of preparation or last revision

Issue date 06-01-2015

Revision date 02-21-2019

Version # 07

Disclaimer Materion Advanced Materials Group cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.