SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product Identifier: (5N) 99.999% Molybdenum Phosphide Sputtering Target

Product Code: MO-P-05-ST

CAS Number: 12163-69-8

Relevant identified uses of the substance: Scientific research and development

Supplier details:

American Elements 10884 Weyburn Ave. Los Angeles, CA 90024 Tel: +1 310-208-0551 Fax: +1 310-208-0351 Emergency telephone number: Domestic, North America +1 800-424-9300 International +1 703-527-3887

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS07
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.
Hazards not otherwise classified
No data available
GHS label elements
GHS label elements, including precautionary statements
Hazard pictograms

GHS07
Signal word: Warning
Hazard statements
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
Precautionary statements
P261
Avoid breathing dust/fume/gas/mist/vapors/spray.
P280
Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances
CAS No. / Substance Name:
12163-69-8 Molybdenum phosphide
Identification number(s):
EC number: 235-312-8

SECTION 4. FIRST AID MEASURES

Description of first aid measures
If inhaled:
Supply patient with fresh air. If not breathing, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
In case of skin contact:
Immediately wash with soap and water; rinse thoroughly.
Seek immediate medical advice.
In case of eye contact:
Rinse opened eye for several minutes under running water. Consult a physician.
If swallowed:
Seek medical treatment.
Information for doctor
Most important symptoms and effects, both acute and delayed
No data available
Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5. FIREFIGHTING MEASURES

Extinguishing media
Suitable extinguishing agents
CO2, sand, extinguishing powder. Do not use water.

**Special hazards arising from the substance or mixture**

If this product is involved in a fire, the following can be released:

- Metal oxide fume
- Phosphorus oxides

**Advice for firefighters**

Protective equipment:
- Wear self-contained respirator.
- Wear fully protective impervious suit.

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**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Environmental precautions:

Do not allow material to be released to the environment without official permits.

Methods and materials for containment and cleanup:

Ensure adequate ventilation.

Prevention of secondary hazards:

No special measures required.

Reference to other sections

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

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**SECTION 7. HANDLING AND STORAGE**

Handling

Precautions for safe handling

- Keep container tightly sealed.
- Store in cool, dry place in tightly closed containers.
- Ensure good ventilation at the workplace.

Information about protection against explosions and fires:

- No data available
- Conditions for safe storage, including any incompatibilities
- Requirements to be met by storerooms and receptacles:
  - No special requirements.

Information about storage in one common storage facility:

- Store away from strong bases.

Further information about storage conditions:

- Keep container tightly sealed.
- Store in cool, dry conditions in well-sealed containers.

Specific end use(s)

- No data available

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**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average
face velocity of at least 100 feet per minute.
Exposure controls
Personal protective equipment
Follow typical protective and hygienic practices for handling chemicals.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Inspect gloves prior to use.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties
Appearance:
Form: Powder
Color: Grey
Odor: No data available
Odor threshold: No data available.
pH: N/A
Melting point/Melting range: No data available
Boiling point/Boiling range: No data available
Sublimation temperature / start: No data available
Flash point: N/A
Flammability (solid, gas): No data available.
Ignition temperature: No data available
Decomposition temperature: No data available
Autoignition: No data available.
Danger of explosion:
Product does not present an explosion hazard.
Explosion limits:
Lower: No data available
Upper: No data available
Vapor pressure: N/A
Density at 20 °C (68 °F): 6.17 g/cm³ (51.489 lbs/gal)
Relative density: No data available.
Vapor density: N/A
Evaporation rate: N/A
Solubility in Water (H₂O): No data available
Partition coefficient (n-octanol/water): No data available.
Viscosity:
Dynamic: N/A
Kinematic: N/A
Other information
SECTION 10. STABILITY AND REACTIVITY

Reactivity
No data available

Chemical stability
Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions
No dangerous reactions known

Conditions to avoid
No data available

Incompatible materials:

Bases

Hazardous decomposition products:
Metal oxide fume
Phosphorus oxides (e.g. P2O5)

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects
Acute toxicity: No effects known.

LD/LC50 values that are relevant for classification: No data

Skin irritation or corrosion: Irritant to skin and mucous membranes.

Eye irritation or corrosion: Causes serious eye irritation.

Sensitization: No sensitizing effects known.

Germ cell mutagenicity: No effects known.

Carcinogenicity:
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

Reproductive toxicity: No effects known.

Specific target organ system toxicity - repeated exposure: No effects known.

Specific target organ system toxicity - single exposure: May cause respiratory irritation.

Aspiration hazard: No effects known.

Subacute to chronic toxicity:
Inorganic phosphorus compounds may cause irritation and hemorrhages in the stomach as well as liver and kidney damage. Bone structure may be attacked, especially the jaw and teeth. Acute molybdenum poisoning may cause severe gastrointestinal irritation, diarrhea, coma and death from cardiac failure.

Chronic molybdenum poisoning in laboratory animals has caused loss of weight, anorexia, anemia, deficient lactation, male sterility, osteoporosis and bone joint abnormalities.

Subacute to chronic toxicity: No effects known.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity
Aquatic toxicity:
No data available

Persistence and degradability
No data available

Bioaccumulative potential
No data available

Mobility in soil
No data available

Additional ecological information:
Do not allow material to be released to the environment without official permits.
Do not allow undiluted product or large quantities to reach groundwater, water courses, or sewage systems.
Avoid transfer into the environment.

Results of PBT and vPvB assessment
PBT: N/A
vPvB: N/A

Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Recommendation
Consult official regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation:
Disposal must be made according to official regulations.

SECTION 14. TRANSPORT INFORMATION

Not a hazardous material for transportation.
UN-Number
DOT, IMDG, IATA
None

UN proper shipping name
DOT, IMDG, IATA
None

Transport hazard class(es)
DOT, ADR, IMDG, IATA
Class
None

Packing group
DOT, IMDG, IATA
None

Environmental hazards:
N/A

Special precautions for user
N/A

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
N/A
Transport/Additional information:
SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS GHS label elements, including precautionary statements
Hazard pictograms
GHS07
Signal word: Warning
Hazard statements
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
Precautionary statements
P261
Avoid breathing dust/fume/gas/mist/vapors/spray.
P280
Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P405
Store locked up.
P501
Dispose of contents/container in accordance with local/regional/national/international regulations.
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).
SARA Section 313 (specific toxic chemical listings)
Substance is not listed.
California Proposition 65
Prop 65 - Chemicals known to cause cancer
Substance is not listed.
Prop 65 - Developmental toxicity
Substance is not listed.
Prop 65 - Developmental toxicity, female
Substance is not listed.
Prop 65 - Developmental toxicity, male
Substance is not listed.
Information about limitation of use:
For use only by technically qualified individuals.
Other regulations, limitations and prohibitive regulations
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
Substance is not listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use)
Substance is not listed.
Chemical safety assessment:
A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2016 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.