

Material Safety Data Sheet

acc. to OSHA and ANSI

- **1 Identification of substance:**

- **Product details:**
- **Product name:** Molybdenum (VI) oxide
- **Stock number:** 3851XW
- **Manufacturer/Supplier:**
Nanostructured & Amorphous Materials, Inc.
16840 Clay Road, Suite #113
Houston, TX 77084, USA

- **2 Composition/Data on components:**

- **Chemical characterization:**
Description: (CAS#)
molybdenum (VI) oxide (CAS# 1313-27-5); 100%
- **Identification number(s):**
- **EINECS Number:** 215-204-7
- **EU Number:** 042-001-00-9

- **3 Hazards identification**

- **Hazard description:** Xn Harmful
- **Information pertaining to particular dangers for man and environment**
R 36/37 Irritating to eyes and respiratory system.
R 48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
- **Classification system**
- **HMIS ratings (scale 0-4)**

(Hazardous Materials Identification System)

Health (acute effects) = 1

Flammability = 0

Reactivity = 1

• **4 First aid measures**

• **After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

• **After skin contact**

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

• **After eye contact**

Rinse opened eye for several minutes under running water. Then consult a doctor.

• **After swallowing** Seek immediate medical advice.

• **5 Fire fighting measures**

• **Suitable extinguishing agents**

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

• **Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

• **6 Accidental release measures**

• **Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

• **Measures for environmental protection:**

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

• **Measures for cleaning/collecting:**

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

• **Additional information:**

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

• **7 Handling and storage**

- **Handling**
- **Information for safe handling:**
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Prevent formation of dust.
- **Information about protection against explosions and fires:**
No special measures required.
- **Storage**
- **Requirements to be met by storerooms and receptacles:**
No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

• **8 Exposure controls and 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.

Components with limit values that require monitoring at the workplace:

Molybdenum and compounds (as Mo)

	mg/m ³
ACGIH TLV	5
Austria MAK	15
Belgium TWA	5
Denmark TWA	5
Finland TWA	5
France VME	5
Germany MAK	5
Netherlands MAC-TGG	5
Sweden NGV	10 (total dust) 5 (respirable dust)
Switzerland TWA	5
United Kingdom TWA	10; 20-STEL
USA PEL	5

- **Additional information:** No data
- **Personal protective equipment**

- **General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

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.

- **Breathing equipment:**

Use suitable respirator when high concentrations are present.

- **Protection of hands:** Impervious gloves

- **Eye protection:** Safety glasses

- **Body protection:** Protective work clothing.

- **9 Physical and chemical properties:**

- **General Information**

- **Form:** Powder

- **Color:** Light blue

- **Odor:** Odorless

	<u>Value/Range</u>	<u>Unit</u>	<u>Method</u>
--	--------------------	-------------	---------------

- **Change in condition**

• Melting point/Melting range:	795	° C	
---------------------------------------	-----	-----	--

• Boiling point/Boiling range:	1155	° C	
---------------------------------------	------	-----	--

• Sublimation temperature / start:	Not determined		
---	----------------	--	--

• Flash point:	Not applicable		
-----------------------	----------------	--	--

• Ignition temperature:	Not determined		
--------------------------------	----------------	--	--

• Decomposition temperature:	Not determined		
-------------------------------------	----------------	--	--

- **Danger of explosion:**

Product does not present an explosion hazard.

- **Explosion limits:**

• Lower:	Not determined		
-----------------	----------------	--	--

• Upper:	Not determined		
-----------------	----------------	--	--

• Vapor pressure:	Not determined		
--------------------------	----------------	--	--

• Density:	at 20 ° C	4.69	g/cm ³
-------------------	-----------	------	-------------------

- **Solubility in / Miscibility with**

- **Water:** at 18 ° C 1.07 g/l

- **10 Stability and reactivity**

- **Thermal decomposition / conditions to be avoided:**
Decomposition will not occur if used and stored according to specifications.
- **Materials to be avoided:**
Oxidizing agents
Acids
- **Dangerous reactions** No dangerous reactions known
- **Dangerous products of decomposition:**
No dangerous decomposition products known

- **11 Toxicological information**

- **Acute toxicity:**
LD/LC50 values that are relevant for classification:
Oral: LD50: 2689 mg/kg (rat)
Dermal: LD50: >2000 mg/kg (rat)
Inhalative: LC50/4H: >5840 mg/m³/4H (rat)
- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Subacute to chronic toxicity:**
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.
- **Additional toxicological information:**
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

- **12 Ecological information:**

- **General notes:**

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

- **13 Disposal considerations**

- **Product:**

- **Recommendation**

Consult state, local or national regulations to ensure proper disposal.

- **Uncleaned packagings:**

- **Recommendation:**

Disposal must be made according to official regulations.

- **14 Transport information**

Not a hazardous material for transportation.

- **DOT regulations:**

- **Hazard class:** None

- **Land transport ADR/RID (cross-border)**

- **ADR/RID class:** None

- **Maritime transport IMDG:**

- **IMDG Class:** None

- **Air transport ICAO-TI and IATA-DGR:**

- **ICAO/IATA Class:** None

- **Transport/Additional information:**

Not dangerous according to the above specifications.

- **15 Regulations**

- **Product related hazard informations:**

- **Hazard symbols:** Xn Harmful

- **Risk phrases:**

36/37 Irritating to eyes and respiratory system.

48/20/22 Harmful: danger of serious damage to health by prolonged

exposure through inhalation and if swallowed.

- **Safety phrases:**

22 Do not breathe dust.

25 Avoid contact with eyes.

- **National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

- **Information about limitation of use:**

For use only by technically qualified individuals.

- **16 Other information:**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.