

Safety Data Sheet

Product No. 29-41, 8079, 91580, 9573, Niobium Products

Issue Date (08-07-13)

Review Date (08-31-17)

Section 1: Product and Company Identification

Product Name: Niobium Products, Pellets, Targets

Synonym: Nb

Company Name

Ted Pella, Inc., P.O. Box 492477, Redding, CA 96049-2477

Inside USA and Canada 1-800-237-3526 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)

Outside USA and Canada 1-530-243-2200 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)

CHEMTREC USA and Canada Emergency Contact Number 1-800-424-9300 24 hours a day

CHEMTREC Outside USA and Canada Emergency Contact Number +1-703-741-5970 24 hours a day

Section 2: Hazard Identification

2.1 Classification of the substance or mixture

This material is not considered hazardous by the OSHA Hazard Communication Standard.

This material is not considered hazardous to health or the environment according to the CLP regulation.

2.2 Label elements

Hazard pictograms: NA

Signal Word: NA

Hazard statements: NA

Precautionary statements: NA

2.3 Other hazards

Niobium powder is flammable.

Health Effects:

NFPA Hazard Rating: Health: ND; Fire: ND; Reactivity: ND

HMIS® Hazard Rating: Health: 0; Fire: 0; Reactivity: 0

(0=least, 1=Slight, 2=Moderate, 3=High, 4=Extreme)

Results of PBT and vPvB assessment: A chemical safety assessment has not been carried out.

PBT: ND

vPvB: ND

Hazards not otherwise classified: Handling or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat. Under normal conditions of use this product is non-hazardous. However, if this product is ground or otherwise processed those ingredients mentioned in Section 3 could be generated.

Emergency overview:

Appearance: Lustrous, steel gray metal.

Immediate effects: Irritation from dusts/powder.

Potential health effects

Primary Routes of entry: Skin and eye contact, inhalation or ingestion of powders and/or dust.

Signs and Symptoms of Overexposure: ND

Eyes: May cause transient, mechanical irritation.

Skin: Generally does not cause skin irritation in solid form. May cause irritation in the form of dusts/powder.

Ingestion: Metallic niobium has a low order of toxicity due to poor absorption from stomach and intestine.

Inhalation: May cause irritation of the mucous membranes. Inhaled particles may be retained in the lungs.

Chronic Exposure: Chronic eye exposure may cause conjunctivitis. Niobium crosses the placental barrier in animals.

Chemical Listed as Carcinogen or Potential Carcinogen: No

See Toxicological Information (Section 11)

Potential environmental effects

See Ecological Information (Section 12)

Section 3: Composition / Information on Ingredients

Principle Hazardous Component(s) (chemical and common name(s)) (Cas. No)	%	OSHA PEL mg/m ³	ACGIH TLV mg/m ³	NTP Carcinogen	IARC Carcinogen	OSHA regulated Carcinogen
Niobium (7440-03-1) Ec-No: 231-113-5	≤100	NE	10 mg/m ³ (Inhalable) 3 mg/m ³ (Respirable)	No	No	No

Targets: 99.95 %

Occupational Exposure Limits for inert or nuisance dust: 15 mg/m³

Section 4: First Aid Measures

If accidental overexposure is suspected

Eye(s) Contact:

Dust: Rinse opened eye for several minutes under running water. Dust or powder should be flushed from the eyes with copious amounts of clean water. If irritations persist obtain medical assistance. Contact lenses should not be worn if working with metal dust and powders.

Solid: Get medical attention if any damage is caused to the eye by the metal.

Skin Contact:

Dust: Wash contaminated area with plenty of water. Skin contamination with dust or powder can be removed by washing with soap and water. If irritation persists obtain medical assistance.

Solid: In solid form, this product generally is not a skin irritant.

Inhalation:

Dust: Breathing difficulty caused by inhalation of dust or fume requires removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical assistance at once.

Solid: NA

Ingestion:

Dust: If symptoms persist, consult a doctor. If vomiting occurs, keep head lower than hips to help prevent aspiration.

Solid: NA

Note to physician

Treatment: Treat symptomatically; no specific treatments.

Medical Conditions generally Aggravated by Exposure: ND

Section 5: Fire Fighting Measures

Flash Point: ND

Flammable Limits: ND

Auto-ignition point: Solid metal will not ignite. High surface area material such as 5 micron powder may auto-ignite at room temperature.

Fire Extinguishing Media: Special powder for metal fires. Do not use water jet or carbon dioxide. To extinguish metal powder fire use dry sand, dry graphite, dolomite, soda ash, sodium chloride or other type “D” fire extinguishing powder.

Special Fire Fighting Procedures: DO NOT USE water, foam, carbon dioxide or halocarbon. Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Wear reflective heat resistant suit. Isolate burning material. It is advisable to allow fires to burn out, keeping fire from spreading.

Unusual Fire and Explosion Hazards: Do not spray water on burning fines, chips or powder as a violent explosion may result. Dust and fumes from this product may be a fire and explosion hazard when exposed to high temperatures or ignition sources. These hazards increase with finer particles.

Hazardous combustion products: The above reaction with incompatible materials will generate hazardous reaction products such as metal oxides, flammable hydrogen, toxic fumes of nitrogen oxides or corrosive niobium halide vapors (See section 10).

DOT Class: Niobium metal powder – Flammable.

Section 6: Accidental Release Measures

Steps to be Taken in Case Material is Released or Spilled:

In solid form, no special measures are required.

In powder or dust form, caution should be taken to minimize airborne generation of powder or dust and avoid contamination of air and water. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Put on appropriate personal protective equipment. Properly label all materials collected in waste container. Recycle material.

Environmental precautions: No specific hazard.

Waste Disposal Methods: Dispose of waste according to Federal, State and Local Regulations.

Section 7: Handling and Storage

Precautions to be taken in Handling and Storage:

Storage: Store and handle in accordance with all current regulations and standards. Store away from incompatible substances, such as oxidizers and mineral acids. Use methods to minimize dust. Machining of niobium may result in fine turnings, chips or dust. Any material with dimension of less than 0.001 inch is flammable. Keep away from source of ignition. Do not accumulate large quantities of fines or machining residues.

Handling: Put on appropriate personal protective equipment. Take care with sharp/heavy items. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking.

Storage temperature: Ambient

Storage Pressure: ND

Section 8: Exposure Controls / Personal Protection

Engineering Controls

Ventilation required: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection Equipment

Respiratory protection: Not normally required if product is in solid form. For powder and dust: Wear appropriate NIOSH-approved respirator if dust or fume exposure levels are exceeded.

Protective gloves: Use strong, cut-resistant gloves for handling metals.

Skin/body protection: Protective work clothing and footwear based on the task being performed and risks involved. Should be approved by a specialist before handling the product.

Eye protection: Safety glasses with side shields.

Exposure Guidelines

See Composition/Information on Ingredients (Section 3)

Section 9 Physical and Chemical Properties

Appearance and Physical State: Silver-grey solid in various forms.

Odor (threshold): Odorless (NA)

Specific Gravity (H₂O=1): 8.47

Vapor Pressure (mm Hg): NA

Vapor Density (air=1): NA

Percent Volatile by volume: ND

Evaporation Rate (butyl acetate=1): NA

Boiling Point: 4927 °C

Melting point: 2468 °C

pH: NA

Solubility in Water: Insoluble

Molecular Weight: ND

Section 10: Stability and Reactivity

Stability: Stable under normal conditions.

Conditions to Avoid: Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation.

Materials to Avoid (Incompatibility): Acids and oxidizing agents. Niobium metal is rapidly dissolved by hydrofluoric acid or hydrofluoric-nitric acid mixtures. Niobium ignites in cold fluorine, and above 200 °C will react exothermically with chlorine, bromine and halocarbons such as carbon tetrachloride, carbon tetrafluoride and freons.

Hazardous Decomposition Products: The above reaction with incompatible materials will generate hazardous reaction products such as flammable hydrogen, toxic fumes of nitrogen oxides or corrosive niobium halide vapors.

Hazardous Polymerization: Will not occur.

Section 11: Toxicological Information

LD/LC50 values that are relevant for classification: ND

Skin irritation or corrosion: May cause irritation.

Eye irritation or corrosion: May cause irritation.

Sensitization: No sensitizing effects known.

Germ cell mutagenicity: No effects known.

Carcinogenicity: ND

Reproductive toxicity: No effects known.

Specific target organ system toxicity: No effects known.

Human experience: ND

This product **does not** contain any compounds listed by NTP or IARC or regulated by OSHA as a carcinogen.

Section 12: Ecological Information

Ecological Information: Do not allow material to be released to the environment without proper governmental permits. Avoid transfer into the environment.

Chemical Fate Information: ND

Section 13 Disposal Considerations

RCRA 40 CFR 261 Classification: Not listed.

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the

requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Federal, State and local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

Section 14: Transportation Information

Rod, Wire, Sheet, Foils: Not Regulated.

The following information applies to metal powders only.

US DOT Information: Proper shipping name: Metal powders, flammable, n.o.s. (Niobium powder)

Hazard Class: 4.1

Packaging group: II

UN Number: UN3089

Limitations: Powder forms

IATA: Proper shipping name: Metal powders, flammable, n.o.s. (Niobium powder)

Hazard Class: 4.1

Packing group: II

UN Number: UN3089

Limitations: Powder forms

Other Classifications found in literature: UN1383, Proper Shipping Name Pyrophoric metals, n.o.s., Hazard Class 4.2, Packing Group I

Section 15: Regulatory Information

United States Federal Regulations

SDS complies with OSHA's Hazard Communication Rule 29, CFR 1910.1200.

SARA: Substance is not listed.

SARA Title III: Substance is not listed.

RCRA: Not listed.

TSCA: All components are listed on the TSCA public inventory.

CERCLA: ND

State Regulations

California Proposition 65: Substance is not listed.

International Regulations

Canada WHMIS: ND

Europe EINECS Numbers: 231-113-5

Section 16: Other Information

Label Information: F (Niobium powder)

European Risk and Safety Phrases: NA

European symbols needed: NA

Canadian WHMIS Symbols: ND

Abbreviations used in this document

NE= Not established

NA= Not applicable

NIF= No Information Found

ND= No Data

Disclaimer

Ted Pella, Inc. makes no warranty of any kind regarding the information furnished herein. Users should independently determine the suitability and completeness of information from all sources. While this data is presented in good faith and believed to be accurate, it should be considered only as a supplement to other information gathered by the user. It is the User's responsibility to assure the proper use and disposal of these materials as well as the safety and health of all personnel who may work with or otherwise come in contact with these materials.

SDS Form 0013F1V4