



MATERIAL SAFETY DATA SHEET
COMPLIES WITH 29 CFR 1910.1200.
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 06-06-96

1. CHEMICAL IDENTITY

LABEL IDENTITY	NIOBIUM
CHEMICAL NAME/SYNONYMS	NIOBIUM
FORMULA	Nb
CALCULATED MOLECULAR WEIGHT	92.91
CHEMICAL FAMILY	GROUP 5 METAL
CAS REGISTRY NUMBER	7440-03-1
HAZARDOUS INGREDIENTS	NIOBIUM
%: 99	TLV: NA OSHA/PEL: 15mg/m3

2. PHYSICAL AND CHEMICAL PROPERTIES

COLOR, FORM AND ODOR	Silver-gray metal, odorless
BOILING POINT	4742°C
DENSITY (gm/cc)	8.57
VAPOR PRESSURE @ 20°	NA
% VOLATILE BY VOLUME (%)	Nonvolatile
REACTION WITH WATER	NA
EVAPORATION RATE (H2O=1)	NA
SOLUBILITY IN WATER	Insoluble
MELTING POINT	2468°C

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	NA
AUTOIGNITION TEMPERATURE (°C)	See section 7
FLAMMABILITY	Will not ignite
EXTINGUISHING MEDIA	Dry table salt or type D fire extinguisher
SPECIAL FIRE FIGHTING PROCEDURES	Isolate burning material. It is advisable to allow fires to burnout, keeping the fire from spreading. Wear reflective heat resistant suit. Small fires can be controlled by smothering with dry table salt or using Type O powder fire extinguishing material.
UNUSUAL FIRE & EXPLOSION HAZARDS	Do not spray water on burning fires, chips or powder as a violent explosion may result. The hazard increases with finer particles, Carbon dioxide is not effective in extinguishing burning niobium.



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4. HEALTH HAZARD INFORMATION

TOXICITY DATA: No toxicity has been shown for metallic Niobium. Laboratory test with soluble niobium compounds show low oral toxicity. Potassium niobate had an oral rat LD50 of 725mg/Nb/kg while potassium niobate introduced into abdominal cavity had a rat LD50 of 92mg/kg and a mouse LD50 of 13mg/kg.

HMIS RATING:

HEALTH: 0 FLAMMABILITY: 0 REACTIVITY: 0 PERSONAL PROTECTION: 0

ROUTES OF ENTRY

**INHALATION: No
SKIN: No
INGESTION: No**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: No data

EFFECTS OF OVEREXPOSURE (acute and chronic):

**INHALATION: None SKIN: None
INGESTION: None EYE: None**

CARCINOGENICITY: No NTP: No IARC MONOGRAPHS: No OSHA REGULATE: No

EMERGENCY FIRST AID PROCEDURES:

**INHALATION: NA INGESTION: NA SKIN: NA
EYE: Normal procedure for foreign objects**

5. REACTIVITY DATA

**STABILITY
CONDITIONS CONTRIBUTING TO UNSTABILITY**

**Stable
Nb metal is rapidly dissolved by hydrofluoric acid hydrofluoric nitric acid mixture. Nb ignites in cold fluorine and above 200°C will react exothermically with chlorine, bromine, and halocarbons such as carbon tetrachloride, carbon tetrafluoride, and freons.**

INCOMPATIBILITY (MATERIALS TO AVOID)

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



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5. REACTIVITY DATA CONTINUED

HAZARDOUS DECOMPOSITION PRODUCTS	ND
HAZARDOUS POLYMERIZATION	Will Not Occur
CONDITIONS TO AVOID	ND

6. SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
No special procedure

WASTE DISPOSAL METHOD:
Fine non-recyclable scrap should be burned in small quantities under controlled conditions. The resulting is inert and can be deposited in a landfill.

7. SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION	Use normal precautions if particulate material is present
LOCAL EXHAUST	ND
MECHANICAL (general)	ND
PROTECTIVE GLOVES	Recommended to avoid cuts
EYE PROTECTION	Safety glasses
OTHER PROTECTIVE EQUIPMENT	Solid metal will not ignite. High surface area material such as 5 micron powder may ignite at room temperature.

8. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:
Machining of Niobium may result in fine turnings, chips or dust. Any material with a dimension less than 0.001" is flammable. Keep away from any source of ignition.

TRANSPORTATION REQUIREMENTS	DOT CLASS:	NA
	UN NUMBER:	NA
	IMCO CLASS:	NA
	OTHER:	NA



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8. SPECIAL PRECAUTIONS CONTINUED

PRECAUTIONARY LABELING

NONE

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NA= NOT APPLICABLE

ND= NO DATA FOUND