



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

DATE OF LAST REVISION: 03-22-96

CHEMICAL IDENTITY

LABEL IDENTITY	NICKEL OXIDE
CHEMICAL NAME/SYNONYMS	NICKEL MONOXIDE, GREEN NICKEL OXIDE NICKELOUS OXIDE, NICKEL PROTOXIDE
FORMULA	NiO
CHEMICAL FAMILY	METAL OXIDE
CAS REGISTRY NUMBER	1313-99-1
HAZARDOUS INGREDIENTS	NICKEL METAL
%: 100	TLV: 0.05 mg Ni/m³ OSHA/PEL: 1mg/Ni/m³

PHYSICAL AND CHEMICAL PROPERTIES

COLOR, FORM AND ODOR	Green crystals, becomes yellow on heating; odor not known.
BOILING POINT	ND
DENSITY (gm/cc)	NA
VAPOR PRESSURE @ 20°	Essentially zero
% VOLATILE BY VOLUME (%)	0
EVAPORATION RATE (H2O=1)	0
SOLUBILITY IN WATER	Insoluble
MELTING POINT	1984° C

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	NA
AUTOIGNITION TEMPERATURE (°C)	ND
FLAMMABILITY	NA
EXTINGUISHING MEDIA	Use agents for metal fires such as dry dry graphite, MET-L-X, or TEC; odorless.
SPECIAL FIRE FIGHTING PROCEDURES	Wear a self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.
UNUSUAL FIRE & EXPLOSION HAZARDS	Nickel powder or dust will support combustion and may form explosive mixtures in air. In a fire, nickel may form Nickel-Carbonyl, a highly toxic substance and known carcinogen.



NICKEL OXIDE MATERIAL SAFETY DATA SHEET

HEALTH HAZARD INFORMATION

TOXICITY DATA

SEE ATTACHED SHEET

HMIS RATING:

HEALTH: **3*** FLAMMABILITY: **1** REACTIVITY: **0** PERSONAL PROTECTION: **X**

ROUTES OF ENTRY

INHALATION: **Yes (primary)**
SKIN: **Yes**
INGESTION: **Yes**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: **Asthma, emphysema, etc.**
EFFECTS OF OVEREXPOSURE (acute and chronic):

INHALATION: **irritation of the mucous membrane and possibly irritation of the respiratory tract may be caused by either dust or nickel fumes. Severe overexposure may result in transient pneumonitis or asthma-like symptoms. Other symptoms include coughing, headache, nausea.**

DERMAL/EYE: **a rash may develop which may be accompanied by redness, itching and swelling. May cause sensitization dermatitis "nickel-itch" and may be accompanied, up to 7 days later, with superficial skin ulcers which may discharge and become crusted. Eye exposure may result in watering and inflammation.**

****Continued on attached sheet****

CARCINOGENICITY: **Yes**

NTP: **Yes**

IARC MONOGRAPHS: **Yes-animal**

OSHA REGULATE: **Yes**

EMERGENCY FIRST AID PROCEDURES:

INGESTION: **if nickel is ingested, contact a physician and induce vomiting**

INHALATION: **remove from exposure, if breathing is difficult, contact a physician, perform artificial respiration as needed**

SKIN CONTACT: **if irritation develops, wash affected area with soap and water, if irritation persists, contact a physician**

EYE CONTACT: **if irritation develops, irrigate eyes for at least 15 minutes with water, if irritation persists, contact a physician**

REACTIVITY DATA

STABILITY

Stable

CONDITIONS CONTRIBUTING TO UNSTABILITY

None

INCOMPATIBILITY (MATERIALS TO AVOID)

Mineral acids, strong oxidizers, also see attached sheet***

HAZARDOUS DECOMPOSITION PRODUCTS

Contact with mineral acids liberated gas which may form explosive mixtures in air

HAZARDOUS POLYMERIZATION

Will Not Occur



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REACTIVITY DATA CONTINUED

CONDITIONS TO AVOID

Nickel (usually in powdered form) is reported to be incompatible with the following: Ammonium Nitrate, Fluorine, performic acid, phosphorus, selenium, and sulfur compounds

SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: NIOSH-approved respiratory equipment should be worn during the clean-up of powder spills. Also wear protective equipment such as gloves and coveralls to prevent skin contact. Collect spills by: 1) wet sweeping, 2) dry sweeping using sweeping compound, or 3) by vacuuming, using a vacuum cleaner equipment with HEPA filter (High Efficiency Particulate air filter). Take care not to raise dust.

WASTE DISPOSAL METHOD:

Consult federal, state and local regulations for proper disposal.

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION

NIOSH approved dust respirators where the airborne nickel levels exceed exposure limits.

LOCAL EXHAUST

Maintain below TLV

MECHANICAL (general)

Maintain adequate ventilation

PROTECTIVE GLOVES

ND

EYE PROTECTION

Safety glasses

OTHER PROTECTIVE EQUIPMENT

Wear appropriate coveralls to prevent skin contact. Safety showers and eye-wash stations should be present in work areas.

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE: Keep material in closed containers. Do not store near mineral acids. Use good housecleaning practices to prevent accumulation of dust. Do not breathe dust. Use approved dust respirators. Avoid prolonged or repeated skin contact. Wash or shower thoroughly after handling and before eating. Clean work clothing should be provided daily.

TRANSPORTATION REQUIREMENTS

**DOT CLASS: Not Classified
UN NUMBER: NC
IMCO CLASS: NC
OTHER: ND**



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SPECIAL PRECAUTIONS CONTINUED

PRECAUTIONARY LABELING

NONE

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND

NR=NOT RECORDED