

NICKEL FACT SHEET

North Carolina Division of Public Health • Occupational and Environmental Epidemiology Branch

Chemical Information

- Nickel is a hard, silvery-white metal
- Odorless and tasteless
- Combustible as a fume or dust
- Can be combined with other metals such as iron, copper, chromium, and zinc to form alloys
- Used in the production of coins, jewelry, valves, and heat exchangers
- Used to make stainless steel

Regulatory Standards

- The Occupational Safety & Health Administration (OSHA) set the PEL for nickel exposures in the workplace at 1.0 mg/m^3 calculated as an 8-hour time-weighted average
- The National Institute for Occupational Safety and Health (NIOSH) set the REL for nickel exposures in the workplace at 0.015 mg/m^3 calculated as a 10-hour time-weighted average

Hazards Identification

Acute Exposures

Inhalation

- Exposure to high concentrations of nickel may result in lung damage
- Individuals sensitized to nickel may have asthma attacks

Dermal

- Direct dermal contact can cause an allergic reaction to nickel, resulting in a skin rash at the site

Chronic Exposures

Inhalation

- Chronic bronchitis and reduced lung function can occur in individuals exposed to high nickel concentrations over time
- Lung and nasal sinus cancers have occurred in those who breathe nickel dust at concentrations greater than 10 mg/m^3 in the workplace

Dermal

- A person can become sensitized to nickel from direct and prolonged contact with the skin.
 - 10-20% of the population is sensitive to nickel
- The International Agency for Research on Cancer (IARC) has classified nickel as a Group 2, B possible carcinogen
 - IARC classifies nickel compounds as Group 1, known carcinogens

Stability & Reactivity

- Reacts with strong acids, sulfur, selenium, wood, and other combustibles to ignite.
- Dust can spontaneously ignite in the air

Handling & Storage

- Should be kept in an explosion proof container within a refrigerator or freezer.
- Should be handled in a closed environment to mitigate the potential for exposure because nickel compounds are considered carcinogens.
 - Environment should be ventilated and particulates captured on a filter for proper disposal.

Glossary

PEL - The Occupational Health and Safety Administration defines Permissible Exposure Levels (PELs) as threshold levels for the workplace that are applicable to exposure periods of 8 hours.

REL - The National Institute for Occupational Safety and Health defines Recommended Exposure Limit (RELs) as threshold levels for the workplace that are applicable to exposure periods of up to 10 hours a day during a 40 hour workweek.

Time weighted average (TWA) - The maximum average exposure to a hazardous contaminant to which workers may be exposed without experiencing significant adverse health effects over said period.

