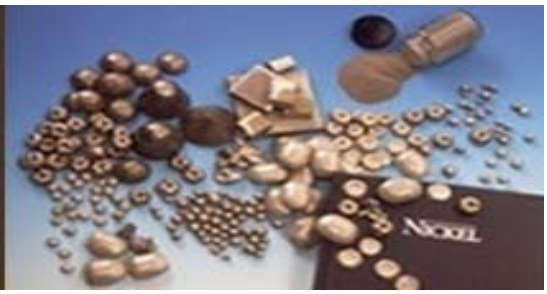
What you should know about nickel



What is nickel?

Nickel is a naturally occurring, hard but pliable, silvery-white metal found in nearly all soils. In the environment, it is most commonly found combined with oxygen and sulfur. In its pure form, the metal can take on a high polish and is resistant to tarnishing.

Nickel is used in over 300,000 products for consumer, industrial, military, transport, aerospace, marine, and architectural applications. Most nickel is used for making stainless steel and heat resistant steels. These are then used to make pots and pans, kitchen sinks, building structures, food processing equipment, and medical equipment. It is used to form alloys or mixtures of metals to make coins, jewelry, armor plating, and items such as valves and heat exchangers.

Nickel can combine with other elements to form compounds that are often green and dissolve fairly easily in water. Nickel compounds are used for nickel plating, to make magnets, to make batteries, to color ceramics, and as substances known as catalysts to increase the rate of chemical reactions.

For more information, contact the:
Texas Department of State Health Services
Environmental and Injury Epidemiology
& Toxicology Group
1100 West 49th Street, MC1964
Austin, Texas 78756
Phone (800) 588-1248

What happens to nickel in the environment?

Nickel and nickel compounds are mainly carried as particles in air, both from natural sources (such as volcanoes) and from human activity. They are commonly released by industries that make or use nickel, nickel alloys, or nickel compounds. Nickel is also released to the air by oil-burning power plants, coal-burning power plants, and trash incinerators.

* In the air, nickel attaches to very small particles of dust that slowly settle to the ground over a period of weeks.
* Nickel released through industrial wastewater ends up in soil or sediment where it attaches to particles containing iron or manganese.
* When it rains small particles of nickel in the air or in the soil can be washed into surface water by runoff.
* Nickel occurs naturally in surface water from the weathering of minerals and rocks so it is not unusual to find it both in surface and groundwater systems.

TEXAS Department of State Health Services

How might I be exposed to nickel?

* Major sources of exposure for most people are by eating food and drinking water that contain natural amounts of nickel. Foods such as chocolate, soy beans, nuts, and oatmeal contain naturally higher levels of nickel.
* Breathing cigarette smoke or smoking tobacco is another way of being exposed to nickel.

* Skin contact with nickel can occur when handling coins, touching other nickel-containing metals, or wearing nickel jewelry.
* Elevated levels of nickel may be encountered near industries using nickel and/or nickel compounds. Occupational exposure can occur in industries using nickel in various forms.
* Others may come into contact with the dust containing nickel carried on the clothes of workers if worn inside the home.
* Nickel is essential for healthy plant life. As a result, it is found naturally in most vegetables, fruits and nuts, and in the food products derived from them, for example – chocolate and wine.

How can nickel affect my health?

The effects of exposure to any substance depend on the type of exposure, concentration of the substance, and the length of time of exposure. Additional factors that must be considered are age, gender, diet, family traits, lifestyle, and health status. In the general population, most people are not adversely affected by nickel at the levels commonly encountered. In fact, studies have shown that small amounts of nickel are essential to maintain proper health in animals and are probably important in human nutrition as well.

About 10-20% of the population is particularly sensitive to nickel. Once sensitized, further contact with the metal may produce a skin reaction at the site of contact. Some sensitive individuals may develop nickel dermatitis, a skin rash at the site of contact with an object (usually jewelry) containing nickel.

Some individuals will develop a rash known as hand eczema, although the site of direct contact may not necessarily have been the hands.

Less frequently, some people who are sensitive to nickel may have asthma attacks following exposure to nickel. Some sensitive people may react when they breathe dust or consume food or water containing nickel.

Workers who have breathed air containing high levels of nickel or its compounds have experienced chronic bronchitis, reduced lung functions, and cancers of the lung and nasal sinus. These workers breathed much higher levels of nickel than those normally found in the environment. Other workers who drank water containing 100,000 times higher-than-normal levels of nickel developed stomach aches and suffered adverse effects to their blood and kidneys.

The U.S. Department of Health and Human Services has determined that nickel by itself may reasonably be considered to be a carcinogen and that nickel compounds are classified as known human carcinogens. Similarly, the U.S. Environmental Protection Agency has determined that nickel containing refinery dust is a human carcinogen.

How can I reduce my exposure to nickel?

Special measures are not needed to reduce exposure, one can reduce exposure to nickel simply by:

* Washing hands and faces before eating if you have been outdoors.
* Covering contaminated soil with clean soil or sod, paving stone, or a deck.
* Cleaning your home regularly with a damp mop/cloth.
* Using removable rugs at entry points to the home and cleaning them outside to reduce dust getting into the house.
* Brushing indoor pets often and outside if possible to reduce dust particles carried into the home.
* Thoroughly cleaning garden vegetables and peeling the outer skin from root crops.