

Nickel - ToxFAQs™

What is nickel?

Nickel (Ni) is an element and a metal found naturally in the environment. It is found in water, soils, and air. Nickel is obtained through mining and recycling. Nickel is mainly used to make stainless steel and is used by many other industries in the United States and worldwide. Combining nickel with other metals, such as iron and copper, forms alloys with numerous uses including in medical devices, jewelry, and coins. Nickel is also used to produce batteries for electrical cars. Nickel compounds are formed when combining nickel with elements like sulfur, hydrogen, and oxygen, and are used in nickel plating and batteries. Nickel is also present in foods, drinking water, tobacco products, and electronic cigarette liquid.



What happens to nickel in the environment?

- Nickel occurs in air, water, sediments, and soil coming from various natural sources and human activities like trash incineration, coal-burning, and oil-burning.
- In air, nickel usually attaches to particles (particulate matter) that may fall to the ground or be brought down by rain or snow.
- Nickel can be transported into streams and waterways through natural weathering or from disturbed soil.
- Nickel can be found naturally in all plants. Certain plants can accumulate more nickel than others.
- Nickel is not expected to accumulate in large amounts in fish or other organisms found in water.

How can I be exposed to nickel?

- You are mainly exposed to nickel by eating foods or drinking water that contain it, but usually in small amounts.
- You may be exposed when you come in direct and prolonged skin contact, including body piercings, with high nickel-releasing items, such as jewelry.
- You may breathe in air that contains small amounts of nickel. You can also breathe in small amounts of nickel by smoking tobacco or tobacco-containing products, or by using electronic cigarettes.
- If you work in an industry that processes or uses nickel, you may have exposure to nickel in the workplace.
- Soils near mines, processing facilities, or waste dumps may be contaminated with nickel but these levels are expected to be low due to regulations and risk management measures.

Nickel allergy is estimated to affect 4–16% of the global population.

How can nickel affect my health?

The most common health effect is an allergic reaction in the form of itchy rash (contact dermatitis). This can happen where your skin comes in direct and prolonged contact with high nickel-releasing items. Globally, an estimated 4% of men and 16% of women in the population may have allergic skin reactions to nickel. You can develop a sensitivity if you have direct and prolonged skin contact with high nickel-releasing items, such as wearing jewelry that releases high amounts of nickel. You may also experience allergic reactions from eating food or drinking water containing nickel. Only a small portion of the nickel-allergic population is susceptible to reactions from oral exposure.

Nickel

Respiratory effects have been reported in workers exposed to nickel or nickel compounds. In laboratory animals, lung damage and nasal effects have been observed at relatively low concentrations of nickel and nickel compounds.

In studies on laboratory animals, eating or drinking large amounts of nickel caused lung effects and effects on the stomach, blood, liver, kidneys, immune system, reproduction, and development.

The [U.S. Department of Health and Human Services \(HHS\)](#) has classified metallic nickel as reasonably anticipated to be a human carcinogen (cancer causing) based on evidence from animal studies. HHS has also classified nickel compounds as known to be a human carcinogen based on evidence in human studies.

The [U.S. Environmental Protection Agency \(EPA\)](#) has classified [nickel subsulfide](#) and [nickel refinery dust](#) as human carcinogens. The EPA has not evaluated whether other nickel compounds are cancer causing.

The [International Agency for Research on Cancer \(IARC\)](#) has determined that metallic nickel is possibly carcinogenic to humans and nickel compounds are carcinogenic to humans.

Can I get a medical test to check for nickel?

You can take a blood, urine, or feces test that will measure the amount of nickel in your body. However, these tests will not predict if you will have health problems or if your health problems are due to nickel. These tests are not part of tests routinely done at a doctor's office, but at a special lab. If you think you may have been exposed to high levels of nickel, talk to your doctor, nurse, or health clinic, or call poison control.

How can I protect my family from nickel exposure?

You may eliminate or reduce the risk of an allergic skin reaction by avoiding direct and prolonged skin contact with high nickel-releasing items such as jewelry and instead purchasing items that are made with surgical stainless steel or are labelled hypoallergenic.

Most people may eat food or drink water that contain low amounts of nickel, which are not usually a cause of concern for health.

If you work with nickel, be sure to wear the necessary protective clothing and equipment and always follow safety procedures, including showering and changing your clothes before you go home each day.

For more information:

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at <https://wwwn.cdc.gov/dcs/ContactUs/Form>

Go to ATSDR's Toxicological Profile for Nickel: <https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=245&tid=44>

Go to ATSDR's Toxic Substances Portal: <http://www.atsdr.cdc.gov/substances/index.asp>

Find & contact your ATSDR Regional Representative at http://www.atsdr.cdc.gov/DRO/dro_org.html

