Nickel - ToxFAQs™

What is nickel?

Nickel (Ni) is an element and a metal found naturallly in the environment. Nickel is obtained through mining and recycling, and can be found in water, soils, and air. Nickel is mainly used to make stainless steel and 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 compounds are formed when combining nickel with elements like sulfur and oxygen, and are used in nickel plating and batteries. Nickel is also present in foods, drinking water, tobacco products, and e-cigarette liquid.

What happens to nickel in the environment?

- Nickel is released from windblown dusts and from 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 most often enters water as runoff, and then generally it strongly attaches to soils.
- Certain plants can take up nickel from soils through their roots and accumulate it.
- Nickel is not expected to accumulate in large amounts in fish or other organisms found in water.

Nickel allergy, usually a skin reaction to touching nickel, is estimated to affect 11-16% of the global population.

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 touch items that contain nickel, such as medical devices or jewelry.
- You may breathe in air that contains small amounts of nickel. You can also breathe in 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 a high exposure to nickel.
- Soils near mines, processing facilities, or waste dumps may be contaminated with nickel.

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 contact with nickel or on another place on your body not directly exposed. Globally, an estimated 11-16% of the population may have allergic skin reactions to nickel. You can develop a sensitivity if you have direct contact with nickel, such as by frequently wearing jewelry containing nickel. You may also experience allergic reactions from eating food, water, or breathing air containing nickel.

Exposure to high amounts of nickel at your job can cause respiratory problems, including asthma if you are allergic. Drinking water that contains high amounts of nickel can cause nausea, diarrhea, vomiting, or cramping, and could potentially negatively affect your kidneys and liver.

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

Nickel

Can nickel cause cancer?

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, based on evidence in human studies. The EPA has not evaluated whether nickel soluble salts are cancer causing.

The International Agency for Research on Cancer (IARC) has determined that nickel compounds and nickel metals are carcinogenic to humans, based on evidence in human and animal studies.

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. 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 nickel-containing products and not wearing jewelry containing nickel.

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.

Want 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

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

If you have any more questions or concerns, you can also find & contact your ATSDR Regional Representative at http://www.atsdr.cdc.gov/DRO/dro_org.html