

NICKEL

What is nickel?

Nickel is a hard, silvery-white metal found in nature. Pure nickel can be combined with other metals such as iron, copper, chromium, and zinc to make alloys. Alloys are used for coins, jewelry, and items such as valves and heat exchangers.

Where can nickel be found and how is it used?

Nickel can be found in the air, attached to dust that is released into the air from factories. In the United States, the amount of nickel in the air has gone down in recent years. Very small amounts of nickel can be found in rivers and lakes. Higher amounts may be found in drinking water, especially if the water is near a factory where nickel is used or processed. Soil can contain nickel. High amounts are found in soil near factories that take nickel out of ore. Most nickel is used to make stainless steel.

How can people be exposed to nickel?

You could be exposed to nickel through:

- **Breathing** air near a plant that uses nickel or near a waste site that contains nickel. Tobacco smoke contains nickel. You can also be exposed by breathing dust or fumes, such as near welding activities.
- **Drinking** water containing nickel. Higher amounts may be found in water near factories where nickel is used or processed.
- **Eating** food that contains nickel.
- **Touching** stainless steel, coins, or jewelry. You could also touch it in soil. This could happen near a factory where nickel is used or produced. It could also be in the soil near a waste site that contains nickel.
- **Eye Contact** by touching the eyes with hands that have been in contact with dust containing nickel.

How does nickel work and how can it affect my health?

Large nickel particles that you breathe can stay in your nose. Smaller nickel particles that you breathe can enter deep into your lungs. If the particles dissolve easily in water, more will be taken into the body from the lungs. If the particles do not dissolve easily in water, the nickel may stay in your lungs for a long time. Some of these nickel particles can leave the lungs with mucus that you spit out or swallow.

Poison Control Center 24/7 Emergency Contact Number: 1-800-222-1222
DPH 24/7 Contact Number: 1-888-295-5156



Frequently Asked Questions

The most common harmful health effect is an allergic reaction. About 10 percent to 20 percent of people are sensitive to nickel. You can become sensitive to nickel when jewelry or other things containing it directly contact the skin. The most common reaction is a skin rash at the site of contact.

Cancers of the lung and nasal sinus have resulted when workers breathed dust containing high levels of nickel compounds. This happened to workers in nickel processing factories. Health agencies have stated that nickel metal is likely to cause cancer.

How is nickel poisoning treated?

Only one nickel compound, called nickel carbonyl, causes severe poisoning when it is breathed in. Severe poisoning also results from eating or drinking nickel salts.

There are several antidotes for poisoning caused by breathing, eating, or drinking nickel. These antidotes will be given in several doses during the first 24 hours after exposure. Doses will continue to be given until the symptoms are gone and the amount of nickel in urine is back to normal. A skin rash caused by nickel can be treated by a diet low in nickel.

What should I do if exposed to nickel?

- **If you breathe nickel carbonyl**, get to an area with fresh air. Remove clothes that have been in contact with the nickel. Oxygen should be provided if needed. Get medical help.
- **If you eat or drink a nickel compound**, get medical help right away. A doctor should provide treatment within one to two hours after exposure.
- **If you get metallic nickel in your eyes**, remove contact lenses if you can do so easily. Rinse with plenty of water for several minutes. Get medical help.
- **If your skin is exposed to nickel**, rinse with plenty of water or shower.

What factors limit use or exposure to nickel?

Nickel is found in many items made with metal. If you are sensitive to nickel, it may be hard to avoid it. An easy way to tell if an item contains nickel is through a special testing kit. You can get a kit from your doctor, drugstore, or through online retailers. In the workplace, reduce exposure by following safety practices.

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Is there a medical test to show whether I've been exposed to nickel?

Tests can show nickel in your blood, waste matter, and urine. These tests cannot tell if there will be harmful effects.

Technical information for nickel

CAS Number: 7440-02-0

Chemical Formula: Ni

Carcinogenicity (EPA): Group A – human carcinogen (refinery nickel dust and nickel subsulfide). The International Agency for Research on Cancer (IARC) has determined that some nickel compounds are carcinogenic to humans; metallic nickel may possibly be carcinogenic to humans.

MCL (Drinking Water): There is no MCL for nickel. However, the EPA recommends that drinking water should contain no more than 0.1 milligrams of nickel per liter of water (0.1 mg/L).

OSHA Standards: 1 mg of nickel per cubic meter of air (1 mg/m³) for metallic nickel and nickel compounds in workplace air during an 8-hour workday, 40-hour work week.

NIOSH Standards: The NIOSH 10-hour time-weighted average (TWA) standard is 0.015 mg/m³.

Resources

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. *Toxicological Profile for Nickel (Update)*. Atlanta, GA: U.S. Department of Health and Human Services. www.goaskalice.columbia.edu

Columbia University, Go Ask Alice – Nickel Allergies, www.goaskalice.columbia.edu

United Kingdom, Health and Safety Executive, “Nickel and You,”
<https://www.hse.gov.uk/pubns/indg351.pdf> at
<https://www.hse.gov.uk/pubns/indg351.htm>