

This fact sheet answers the most frequently asked health questions (FAQs) about tungsten. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tungsten is a naturally occurring element. Exposure to very low levels of tungsten may occur by breathing air, eating food, or drinking water that contains tungsten. No specific health effects have been associated with exposure to tungsten in humans. Exposure to high levels of tungsten is unlikely. Tungsten has been found in at least 6 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is tungsten?

Tungsten is a naturally occurring element. It occurs in rocks and minerals combined with other chemicals, but never as a pure metal. Elemental tungsten is a white to steel gray metal (depending on the purity) that can be used in pure form or mixed with other metals to make alloys. Tungsten alloys tend to be strong and flexible, resist wear, and conduct electricity well. Tungsten is used in products such as x-ray tubes, light bulbs, high-speed tools, welding electrodes, turbine blades, golf clubs, darts, fishing weights, gyroscope wheels, phonograph needles, bullets, and armor penetrators. Tungsten is also used as a catalyst to speed up chemical reactions.

Chemical compounds of tungsten are used for many purposes. Cemented tungsten carbide is a hard substance used to make grinding wheels and cutting or forming tools. Other tungsten compounds are used in ceramic pigments, as fire retardant coatings for fabrics, and as color-resistant dyes for fabrics.

What happens to tungsten when it enters the environment?

- Tungsten is an element that exists naturally in the environment.
- It is an element that cannot be formed or destroyed.
- Tungsten in water comes mainly from water dissolving tungsten from rocks and soil that it runs over or through.

- Tungsten in air comes from the weathering of rocks, from the mining of tungsten ore, or from emissions from industries making tungsten metal or hard metal products.
- Tungsten particles in air can settle out onto soil, water, or plant surfaces, or they can be brought down in rain or snow.
- Water and air are not normally tested for tungsten.
- If coal ash, incinerator ash, or industrial waste contains high levels of tungsten, it can increase the levels in soil with which it is mixed.
- Most tungsten in soil binds with the soil and will not reach groundwater.
- As soil conditions change, tungsten may dissolve out of soil and rocks in one location and bind back to soil and rocks in another location.

How might I be exposed to tungsten?

- You can be exposed to very low levels of tungsten by breathing air, eating food, or drinking water that contains tungsten. Urban air generally contains more tungsten than rural air.
- In general, exposure to tungsten from air, drinking water, and food is expected to be very small.
- Air normally contains less than 10 nanograms of tungsten per cubic meter (a nanogram is 1 billionth of a gram).
- Occupational exposure to higher than background levels of tungsten may occur if you use tungsten metal or are engaged in the machining of these metals. Occupational exposure to tungsten carbide occurs during the machining of tungsten carbide tools in the manufacturing process.

ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>

Tungsten metal and metal alloys occur in consumer products such as electronics, light bulb filaments, cemented tungsten carbide grinding wheels and carbide tipped tools. They are also present in “green bullets” that are made without lead.

How can tungsten affect my health?

Tungsten compounds have caused breathing problems and changed behavior in some animals given large amounts of tungsten compounds. However, you are not likely to be exposed to amounts of tungsten in the air you breathe or the food or water you take into your body that would be large enough to cause similar effects.

How likely is tungsten to cause cancer?

There is not enough information to determine whether inhalation, oral, or dermal exposure to tungsten or tungsten compounds can cause cancer in humans. Tungsten has not been classified for carcinogenic effects by the Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), or the EPA. Tungsten has been recommended to the National Toxicology Program (NTP) for testing in laboratory animals, which includes a cancer assessment.

How can tungsten affect children?

Children may be affected in the same way as adults. We do not know whether children differ from adults in their susceptibility to tungsten. Animal studies have shown that tungsten can pass from the maternal blood through the placenta and reach the fetus.

How can families reduce the risks of exposure to tungsten?

- It is very unlikely that tungsten is present in the average home or apartment at unsafe levels.
- Use bottled water if you have concerns about the presence of tungsten in your tap water.

If you get tungsten dust on your clothes, shower and change your clothes before leaving your job and returning home.

Is there a medical test to determine whether I've been exposed to tungsten?

Tests are available to measure tungsten in your blood, urine, hair, saliva, and feces. These tests are not usually done in the doctor's office because they require special equipment. Elevated levels of tungsten in the feces can mean high recent tungsten exposure. Elevated levels of tungsten in the urine and/or blood can mean high tungsten consumption and/or high exposure. The average urine concentration for the U.S. population was 0.083 µg/L in 2003.

Has the federal government made recommendations to protect human health?

For tungsten and insoluble tungsten compounds in air, the National Institute for Occupational Safety and Health (NIOSH) recommends an exposure limit of 5 mg/m³ (average over a 10-hour period) and a short-term (15 minutes) exposure limit of 10 mg/m³. The Occupational Safety and Health Administration (OSHA) set limits for tungsten of 5 mg/m³ (insoluble compounds) and 1 mg/m³ (soluble compounds) for construction and shipyard industries.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Tungsten Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

