

This fact sheet answers the most frequently asked health questions (FAQs) about Otto Fuel II and its components. 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's 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.

SUMMARY: Exposure to Otto Fuel II occurs in areas where Otto Fuel II is used as a torpedo fuel or where it is made. Headaches are the most common effects from overexposure. Other effects include loss of balance, poor eye-hand coordination, eye irritation, nasal congestion, nausea, dizziness, and difficulty breathing. This substance has been found in at least 2 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is Otto Fuel II?

(Pronounced ɔt'ō fyōō'əl 2)

Otto Fuel II is a distinct-smelling, reddish-orange, oily liquid that the U.S. Navy uses as a fuel for torpedoes and other weapon systems. It is a mixture of three synthetic substances: propylene glycol dinitrate (the major component), 2-nitrodiphenylamine, and dibutyl sebacate.

Propylene glycol dinitrate, a colorless liquid with an unpleasant odor, is explosive. 2-Nitrodiphenylamine is an orange solid used to control the explosion of propylene glycol dinitrate. Dibutyl sebacate is a clear liquid used for making plastics, many of which are used for food packaging. It is also used to enhance flavor in some foods such as ice cream, candy, baked goods, and nonalcoholic drinks, and is found in some shaving creams.

What happens to Otto Fuel II and its components when they enter the environment?

- ❑ Otto Fuel II enters the environment mainly in waste water from Naval facilities that produce it or are involved in torpedo operations.
- ❑ All three components can be broken down by microorganisms in soil and water.

- ❑ Propylene glycol dinitrate evaporates rapidly; dibutyl sebacate and 2-nitrodiphenylamine do not evaporate easily.
- ❑ 2-Nitrodiphenylamine does not dissolve easily in water and will be found associated with soil and sediments.

How might I be exposed to Otto Fuel II and its components?

- ❑ Breathing contaminated air or touching fuel in areas where Otto Fuel II is used or where it is made.
- ❑ Eating food that contains dibutyl sebacate.

How can Otto Fuel II and its components affect my health?

Most of the effects of Otto Fuel II on people's health are believed to be caused by propylene glycol dinitrate. People who work around Otto Fuel II report headaches, poor eye-hand coordination, eye irritation, congested noses, nausea, dizziness, and difficulty breathing.

The most common effect of overexposure is headache. The greater the overexposure, the larger the number of reported symptoms. People who have worked around Otto Fuel II, but are no longer exposed to it, might feel chest pain or rapid beating of the heart.

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

We do not know if Otto Fuel II affects the ability of people to have children or if it causes birth defects.

Animal studies show effects of propylene glycol dinitrate that are similar to the effects seen in people. Exposure of animals to moderate-to-large amounts for several weeks causes problems in the blood, such as a decreased ability of blood to carry oxygen. The livers and kidneys of some animals exposed to moderate levels of propylene glycol dinitrate 24 hours a day for several months showed damage. We do not know if these effects might also occur in persons exposed to sufficiently high concentrations.

Rats that had Otto Fuel II applied to their skin during pregnancy gave birth to babies with low birth weights.

It is not known if propylene glycol dinitrate causes birth defects in animals. The health of animals that ate large amounts of dibutyl sebacate for long periods was not affected. The babies of animals that ate large amounts of dibutyl sebacate grew more slowly than babies of animals that did not eat it.

We do not know anything about the health effects of 2-nitrodiphenylamine in animals.

How likely are Otto Fuel II and its components to cause cancer?

The International Agency for Research on Cancer (IARC), the Department of Health and Human Services (DHHS), and the EPA have not reviewed Otto Fuel II to determine whether it is likely to cause cancer.

No human studies examine the carcinogenicity of Otto Fuels II or any of its components. Animal studies of propylene glycol dinitrate and dibutyl sebacate haven't determined

whether these compounds are carcinogenic. The carcinogenicity of 2-nitrodiphenylamine has not been studied in animals.

Is there a medical test to show whether I've been exposed to Otto Fuel II and its components?

No routine medical test shows if you have been exposed to Otto Fuel II. Breakdown products of propylene glycol dinitrate have been measured in blood and exhaled air, but these products leave your body within a day, so the tests must be given within a few hours of exposure. No tests are known for measuring the other two components of Otto Fuel II in your body.

Has the federal government made recommendations to protect human health?

The National Institute for Occupational Safety and Health (NIOSH) recommends that workers not be exposed to air containing more than 0.05 parts propylene glycol dinitrate per million parts of air (0.05 ppm) during a 10-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or a gas.

ppm: Parts per million.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for Otto Fuel II. 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.

