

This fact sheet answers the most frequently asked health questions (FAQs) about RDX. For more information, call the CDC Information Center at 1-800-232-4636. 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: RDX is an explosive. People who work with RDX can be exposed to it. It is unlikely that the general population will be exposed to RDX. Exposure to high amounts of RDX can affect the nervous system and produce seizures. RDX has been found in at least 31 of the 1,699 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is RDX?

RDX stands for Royal Demolition eXplosive. It is also known as cyclonite or hexogen. The chemical name for RDX is hexahydro-1,3,5-trinitro-1,3,5-triazine. It is a white powder and is very explosive.

RDX is used as an explosive and is also used in combination with other ingredients in explosives. Its odor and taste are unknown. RDX is a synthetic chemical, it does not occur naturally in the environment. It creates fumes when it is burned with other substances.

What happens to RDX when it enters the environment?

- Particles of RDX can enter the air when it is disposed of by burning.
- RDX can enter lakes, rivers, and groundwater from disposal of waste water from ammunition plants or from spills or leaks after improper disposal at these sites.
- RDX dissolves very slowly in water, and it also evaporates very slowly from water.
- RDX that is spilled onto land will not bind to soil very strongly and can move into groundwater from soil.
- RDX can be broken down in air and water in a few hours, but it breaks down more slowly in soil.
- RDX does not build up in fish or in people, but has been shown to be taken up by plants grown in RDX-contaminated soil.

How might I be exposed to RDX?

- People who work with RDX can potentially breathe RDX dust or get it on their skin. They can also breathe fumes of burning RDX.
- RDX has been found in water and soil near some ammunition plants and storage areas. People who live near these areas can be exposed by drinking contaminated water or touching contaminated soil in the area.
- People who eat crops grown in contaminated soils may be exposed to RDX.

How can RDX affect my health?

RDX affects mainly the nervous system. It can cause seizures in humans and animals when large amounts are breathed in or ingested. Some people exposed to high amounts of RDX have had changes in blood pressure and in some parts of the blood. The effects of long term exposure to low levels of RDX are not known.

It is not known whether RDX affects reproduction in people.

How likely is RDX to cause cancer?

There are no studies of cancer in people exposed to RDX. The EPA has determined that RDX is a possible human carcinogen based on the presence of liver tumors in mice exposed to RDX in the food for 1 to 2 years.

How can RDX affect children?

There are no studies of children exposed to RDX, but a child who accidentally ingested RDX had seizures, which is the same as adults exposed to high amounts of RDX.

We do not know whether children are more susceptible to the effects of RDX than adults. Young rats were more sensitive than older rats to the acute toxic effects of RDX.

We do not know whether RDX produces birth defects in humans. Exposure of animals to RDX during pregnancy has not produced birth defects in newborn animals.

There are no studies that looked for RDX in human breast milk. RDX was found in the milk of rats exposed during pregnancy. In the same study, it was found that RDX could pass through the placenta and reach the fetus.

How can families reduce the risk of exposure to RDX?

- RDX is not found in consumer products. Therefore, families are not expected to have contact with RDX through the use of consumer products.
- Families whose tap or well water may be contaminated with RDX may choose to drink or cook with bottled water or to install activated carbon water filters.

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

RDX can be measured in blood and urine, but these are not routine tests that can be performed in a doctor's office. We do not know whether the presence of RDX in the blood indicates that you were exposed briefly a few days before the test was done or that you are experiencing constant exposure.

The tests for RDX in blood and urine cannot be used to determine how much RDX entered your body. The presence of RDX in your blood does not necessarily mean that you will suffer adverse health effects. The usual immediate health effects are seizures, muscle twitching, or vomiting from very high exposures. These would probably occur before you had the blood or urine test.

Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to RDX in drinking water at concentrations of up to 0.1 mg/L for up to ten days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 0.002 mg/L RDX in drinking water is not expected to cause any adverse effects.

The Occupational Health and Safety Administration (OSHA) had previously set up a limit of 1.5 mg/m³ for RDX in workplace air in March 1989; however, since 1992 there is no enforceable regulation.

The National Institute for Occupational Health and Safety (NIOSH) has set a 10-hour time-weighted average recommended exposure limit of 1.5 mg/m³ and a 15-minute short term exposure limit of 3 mg/m³ for workers.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for RDX. Atlanta, GA: U.S. Department of Public 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 and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

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.