ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

RDX
CAS # 121-82-4

This fact sheet answers the most frequently asked health questions (FAQs) about RDX. 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: RDX is an explosive. Few people will be exposed to RDX. Exposure to large amounts can cause seizures. RDX has been found in at least 16 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is RDX?

(Pronounced RDX)

RDX stands for Royal Demolition eXplosive. It is also known as cyclonite or hexogen. The chemical name for RDX is 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. It is a synthetic product that 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 the water from disposal of waste water from Army ammunitions plants, and it can enter water or soil from spills or leaks from improper disposal at these plants or at hazardous waste sites.
- RDX dissolves very slowly in water, and it also evaporates very slowly from water.
- It does not cling to soil very strongly and can move into the 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.

How might I be exposed to RDX?

Few people will be exposed to RDX. Fewer than 500 people are known to work with RDX. These people can be exposed by:

- Breathing dust with RDX in it.
- Getting RDX on their skin.
- Drinking contaminated water or touching contaminated soil near factories that produce RDX.

How can RDX affect my health?

RDX can cause seizures (a problem of the nervous system) in humans and animals when large amounts are inhaled or eaten. The effects of long-term (365 days or longer), low-level exposure on the nervous system are not known. Nausea and

vomiting have also been seen. No other significant health effects have been seen in humans.

Rats and mice that ate RDX for 3 months or more had decreased body weights and slight liver and kidney damage.

It is not known whether RDX causes birth defects in humans; it did not cause birth defects in rabbits, but it did result in smaller offspring in rats. It is not known whether RDX affects reproduction in people.

How likely is RDX to cause cancer?

The EPA has determined hat RDX is a possible human carcinogen.

In one study, RDX caused liver tumors in mice that were exposed to it in the food. However, carcinogenic effects were not noted in rat studies and no human data are available.

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

Medical tests are available that can measure RDX levels in your blood or urine. However, these tests can only be used if you have come in contact with RDX in the last few days. These tests can determine if you have been exposed to RDX, but they cannot be used to determine how much RDX entered your body.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. However, they cannot be used to determine long-term health effects from RDX.

The usual immediate health effects (seizures, muscle twitching, or vomiting) from very high exposures would probably occur before you had the blood or urine test.

Has the federal government made recommendations to protect human health?

The Department of Transportation (DOT) has many regulations on the transportation of explosives.

The EPA recommends a drinking water guideline of 2 micrograms (μg) RDX per liter for lifetime exposure for adults.

The National Institute for Occupational Safety and Health (NIOSH) has recommended an exposure limit of 1.5 milligrams RDX per cubic meter of air (1.5 mg/m^3) for a 10-hour workday, 40-hour workweek.

The NIOSH short-term exposure limit, which is the highest level of RDX that they recommend workers be exposed to for 15 minutes, is 3 mg/m^3.

The American Conference of Governmental Industrial Hygienists (ACGIH) also recommends an exposure limit of 1.5 mg/m^3 in workplace air for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogen: A substance that can cause cancer.

CAS: Chemical Abstracts Service.

Dissolve: To disappear gradually.

Evaporate: To change into a vapor or a gas.

Microgram (μg): One millionth of a gram.

Milligram (mg): One thousandth of a gram.

Tumor: An abnormal mass of tissue.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for RDX. 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.