CBRN Hazardous Substances

We live in an industrial society and benefit from the opportunities provided by modern technology. But there is no technology without risks. Thus, it is also a part of our lives that hazardous substances may be released – in spite of all the safety standards. For example, in the event an accident to a dangerous goods transport vehicle, a fire in a factory or a chemical products warehouse. However, the careless handling of household detergents at home can also be dangerous.

Firefighters in action because of a chemical accident on an industrial estate, 2006

What is a hazardous substance?

➤ The range of hazardous substances is large. A distinction is made between **chemical (C), biological (B), radiological (R), and nuclear (N) hazardous substances**

CBRN hazardous substances may occur in a gaseous or vaporous form, as aerosols, as liquids or as solids. A lay person cannot generally recognise the danger. Therefore: if something happens, report it to the **rescue coordination centre (Tel. 112)** or the **poison information centre** (ask for the number of the poison information centre near you and make a note of it on the back of this brochure).
In the event of more serious incidents, pay attention to announcements on the radio or by loudspeaker vehicles.

CHEMICAL HAZARDOUS SUBSTANCES

Chemicals exhibit a very wide range of different effects. Many substances are combustible or even explosive; they may be corrosive or poisonous. Sometimes, they even have a number of effects at the same time. In most cases, they have their greatest impact when they are absorbed into the body. This can take place through the skin, by ingestion or by inhalation.
Particular care is required in the case of gaseous substances. As most gases and vapours are heavier than air, they may accumulate in depressions or cellars. When chemicals are released, such places should, therefore, be avoided.

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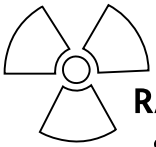
Firefighters during a, simulation of a laboratory accident in the Office of Criminal Investigation of the Land in Mainz, Rhineland-Palatinate, 2003

BIOLOGICAL HAZARDOUS SUBSTANCES

Biological hazardous substances include bacteria, viruses, fungi, parasites and toxins. They may trigger serious diseases in people. They are primarily absorbed into the body via mucous membranes (respiratory tracts, gastrointestinal tract, eyes) and the skin (wounds). In the event of the risk of absorption via the respiratory tracts, at least provisional respiratory protection should be used, e.g. dust mask.



RADIOACTIVE SUBSTANCES

Radiological (R) and nuclear (N) substances describe the different types of production of a radioactive contamination. Radioactive substances emit high-energy, ionising radiation. This radiation can damage living cells and kill them or cause cancer. A particular danger comes from the absorption of radioactive substances into the body. This can take place by inhalation, ingestion and through the skin (wounds). Alpha radiation (a type of ionising radiation), in particular represents a high risk potential. Here, respiratory protection helps you before you inhale it into your lungs. Ionising radiation is weakened when it passes through matter. In cellars, the weakening effect is particularly great due to the adjacent layer of earth and the higher floors.

Behaviour in the event of the release of hazardous substances

There are hazardous substances in the air or in the water? What should you do now?
Pay attention to announcements on the radio, television or from loudspeaker vehicles. Seek information on the Internet. And inform other occupants of the building.

Chemical accident

INDOORS

- Stay in the building.
- Temporarily take in endangered passers-by.
- Inform – if necessary – other occupants of the building.
- Close windows and doors.
- Turn off fans and air conditioning systems; close the ventilation slots in the window frames.
- Seek out a protected internal room in your apartment, ideally one which has no outside windows.

INDOORS

› In the event that radioactive substances are released, seek out a cellar from preference.
› Avoid the unnecessary consumption of oxygen by candles or similar.
› Turn the radio (VHF, regional stations) or the television on to get information.
› Pay attention to the announcements by the authorities and the emergency personnel.
› Only make telephone calls in emergencies.
› In the event of the ingress of hazardous substances, use the available respiratory protective devices, if necessary an improvised face mask (surgical masks, cloths...).

OUTSIDE

› Pay attention to announcements by the police and the fire brigade.
› Move across the direction of the wind, if possible; breathe through a respiratory protection device, if possible, at least through a handkerchief.
› Seek out the nearest closed building.
› If you have already come into contact with hazardous substances, change your outer clothing and shoes.
› Pack the contaminated outer clothing and shoes in plastic bags and place these outside the living area, outside the building, as far as this is possible.
› First wash your hands thoroughly, then your face and hair, as well as your nose and ears, with soap and water.

Every household should have a respiratory protection mask.

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Close all windows and doors

Serious accident of a dangerous goods HGV

› In the event that biological substances are released, the disinfection of your hands is also recommended.
› Follow the instructions for sheltering in buildings.

IN THE CAR

› Switch off the ventilation and close the windows.
› Listen to the radio (VHF, region stations) and follow the instructions of the authorities and emergency personnel.
› Seek out the nearest closed building, request admission and observe the instructions for sheltering in buildings there.