



# HAZMAT and Decontamination

Customized solutions

 **rosenbauer**

# Hazmat equipment

## Special solutions for emergencies.



Recognize danger

Rosenbauer offers the right solutions for dealing with hazardous materials (HAZMAT = hazardous materials). Materials are labeled as hazardous if their release could pose danger to life and the environment. These materials are produced and transported in the physical states of solid, liquid, or gaseous. They can damage the human organism depending on the concentration and exposure time.

### Classification of dangerous substances

Dangerous substances are classified in:

- (A) Nuclear
- (B) Biological and
- (C) Chemical materials

Three stages are differentiated depending on the potential danger and the extent of damage.



## ■ Emergency measures for accidents with hazardous materials

### 1. Recognize danger - investigate

- Perception: e.g. smoke, for, flames, hissing of an escaping gas etc.
- Designation on trucks, tankers, freight containers or on drums, canisters or gas cylinders: e.g. danger note, warning sign, shipping documents, safety data sheets
- Measuring: e.g. with gas sensors

### 2. Cordon off and secure

The accident area should be cordoned off over a wide area, not only to prevent approaching persons and vehicles from creating even greater damage, but also to permit rescue personnel to work without obstructions.

### 3. Rescue persons!

People must be rescued quickly during every operation. The head of operations is responsible for determining conditions.



### 3 golden rules

The larger the distance from the contaminant, the shorter the time of stay in the danger zone and the better the shielding (protective clothing) against the respective substances, the smaller is the harmful effect.

*Cordon off and secure*

#### 4. Stabilize the situation: Collect – Seal – Pump

- Collect: e.g. by placing collecting trays, providing a catch basin
- Seal: e.g. by inflating pneumatic leak-sealing bags or hammering a sealing wedge into a tear or puncture
- Pump: e.g. by pumping out of the defective tank or container and pumping into another container



*Stabilize the situation*

# Hazardous substances

## Three stages of danger.

|                 | (A) Nuclear hazards | (B) Biological hazards | (C) Chemical hazards |
|-----------------|---------------------|------------------------|----------------------|
| Stage 1: small  | A1                  | B1                     | C1                   |
| Stage 2: medium | A2                  | B2                     | C2                   |
| Stage 3: large  | A3                  | B3                     | C3                   |

■ Equipment fully covered by Rosenbauer delivery program. ■ Equipment partly covered by Rosenbauer ■ Equipment not covered by Rosenbauer



Example C2

The Rosenbauer line concentrates on the areas that are shown in green – these cover most of the operational areas of fire departments.

- Transport accidents (e.g. roads, rails, shipping, air transport)
- Accidents in industrial plants (e.g. refineries, chemical industry)
- Terrorist attacks (e.g. the discovery of a suspicious powder)
- Incidents in nuclear power plants



Example **B2**

Dangers from nuclear, biological, and chemical substances are classified into three stages depending on the potential danger and the extent of damage.

#### Exemplary uses depending on type and extent of the danger(s)

|           |                                                                                                                                                                              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A1</b> | Breakage of a bottle with radioactive fluid in a hospital laboratory. The fluid must be bound, fragments must be collected and disposed of. Decontamination may be required. |
| <b>A2</b> | Search and tracing job for a searching source for non-destructive material inspection on a highway. The source must be found, isolated and put into storage.                 |
| <b>A3</b> | Maximum credible accident at a nuclear power plant (e.g. Fukushima).                                                                                                         |
| <b>B1</b> | Recovery of a dead swan suspected of having avian flu.                                                                                                                       |
| <b>B2</b> | HAZMAT operation in a biological laboratory: saving contaminated people. Decontamination is required before they can receive medical attention.                              |
| <b>B3</b> | Terrorist warning! Anthrax pathogens have been planted in a fully packed soccer stadium. The powder must be investigated. Extensive measures are required.                   |
| <b>C1</b> | An automobile battery is leaking. The acid must be bound.                                                                                                                    |
| <b>C2</b> | Leaking barrel with a flammable fluid on a truck. The fluid must be transferred and the barrel must be recovered.                                                            |
| <b>C3</b> | Release of a poisonous gas from a tanker. The populace must be warned. The wagon must be sealed and pumped out.                                                              |



Example **A2**



Example **C2**

# Decontamination

## BASIC. STANDARD. MASS.

Contamination is the exposure of persons, objects, rooms, or the environment to radioactive (nuclear) (A) and/or biological (B) and/or chemical materials (C).

Decontamination is the reduction or removal of a hazardous material from a surface (mainly from protective clothing and own equipment). It is therefore to be carried out carefully after every operation!



MASS  
decontamination



MASS decontamination



STANDARD decontamination

Three stages are distinguished depending on scope and intensity of the decontamination:

### Decontamination

|                 |            |
|-----------------|------------|
| Stage 1: small  | ■ BASIC    |
| Stage 2: medium | ■ STANDARD |
| Stage 3: large  | ■ MASS     |

■ Equipment fully covered by Rosenbauer delivery program.

### DECON stage 1

#### BASIC decontamination

DECON stage 1 is carried out for small-scale operations. This takes place on a single decontamination area (tub) and is used to decontaminate operational personnel and/or their equipment. In addition to the decontaminant (e.g. polyethylene glycol), only cold water is used.

### DECON stage 2

#### STANDARD decontamination

With around 6 persons or more, i.e. for medium or large-scale operations, a structured DECON procedure with the following stations is required: Preliminary cleansing and primary cleansing (cold and warm water), followed by regeneration (dressing and supply).

**CAUTION !!!**

Contamination occurs during every fire fighting operation to varying degrees.

*STANDARD decontamination*

### DECON stage 3

#### MASS decontamination

DECON stage 3 requires an extensive cleansing technique that is preinstalled in a vehicle together with an electric power supply. The operational personnel undergo preliminary cleansing in a decon shower set up outside. Then the protective suits are taken off and put into storage. "Fine-scale decontamination" takes place inside the vehicle. Afterwards, the decontaminated person receives replacement clothing or regeneration may take place (e.g. drinking isotonic beverage). Alternatively, a Mass DECON set is also available as DECON stage 3 for the decontamination of a large number of civilians at large-scale events, for example. Among other things, this includes three inflatable tents (removal of contaminated clothing, cleansing, dressing, and supplies).



*BASIC decontamination*

# HAZMAT and DECON concepts

|                              | Nuclear |   | Biological |   | Chemical |   |   | DECON |   |   |
|------------------------------|---------|---|------------|---|----------|---|---|-------|---|---|
|                              | 1       | 2 | 1          | 2 | 1        | 2 | 3 | 1     | 2 | 3 |
| HAZMAT CL                    |         |   | ■          |   | ■        | ■ |   | ■     |   |   |
| HAZMAT AT                    | ■       | ■ | ■          | ■ | ■        | ■ | ■ | ■     | □ |   |
| HAZMAT SOF with control room | ■       | ■ | ■          | ■ | ■        | ■ | ■ | ■     | ■ |   |
| HAZMAT GWG SOF               |         |   | ■          |   | ■        | ■ | ■ | ■     |   |   |
| HAZMAT WLA                   | ■       | ■ | ■          | ■ | ■        | ■ | ■ | ■     |   |   |
| HAZMAT GWG WLA               |         |   | ■          |   | ■        | ■ | ■ | ■     |   |   |
| DECON SOF                    |         |   |            |   |          |   |   | ■     | ■ | ■ |
| DECON WLA                    |         |   |            |   |          |   |   | ■     | ■ | ■ |

■ Equipment fully covered by Rosenbauer delivery program. □ Upgrade to DECON 2 with "Warm water / DECON shower" MEC (Mobile Equipment Carrier).





HAZMAT AT A2 B2 C3 D1



DECON SOF D3



HAZMAT SOF with control room [A2](#) [B2](#) [C3](#) [D2](#)



HAZMAT WLA [A2](#) [B2](#) [C3](#) [D1](#)

HAZMAT GWG WLA [B1](#) [C3](#) [D1](#)





HAZMAT WLA A2 B2 C3 D1



DECON WLA D3

DECON SOF D3



## MEC (Mobile Equipment Carrier)

The Mobile Equipment Carrier solutions are a compact supplement to the Rosenbauer modular concept. The equipment package required for the corresponding operational purpose is supplied on mobile, autonomous device carriers.

Examples of mobile equipment carrier packages:

- MEC „DECON tent“
- MEC „Warm water / DECON shower“
- MEC „DECON shower“
- MEC „Collecting equipment“
- MEC „Sealing equipment“
- MEC „Pumping equipment“
- MEC „Power supply“



MEC "DECON tent"



MEC "DECON shower"



MEC "Recirculation equipment"



MEC "Sealing equipment"



MEC "Power generator"