ERSTE HILFE STATION

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FIRE SAFETY ASSISTANTS AT THE WORKPLACE

Responsible for content: Erste Hilfe Station, Andreas Borucki
Geygerstraße 17 · 12043 Berlin · Tax no.: 16/237/50935
T. +49 (0)30 37 43 76 83 · M. +49 (0)157 84 82 88 44
info@erstehilfestation.de · www.erstehilfekursberlin.de/brandschutz

< *Part A of the fire safety regulations (see image) is posted up on the premises, clearly visible to all staff.*

Part B sets out for the staff the exact procedures to be followed. >

Part C lists the people in charge, members of staff with special training and their respective areas of responsibility.

1. Legislation

The owner/operator of the company is responsible for organising fire safety. The relevant legal texts and sources are set out below:

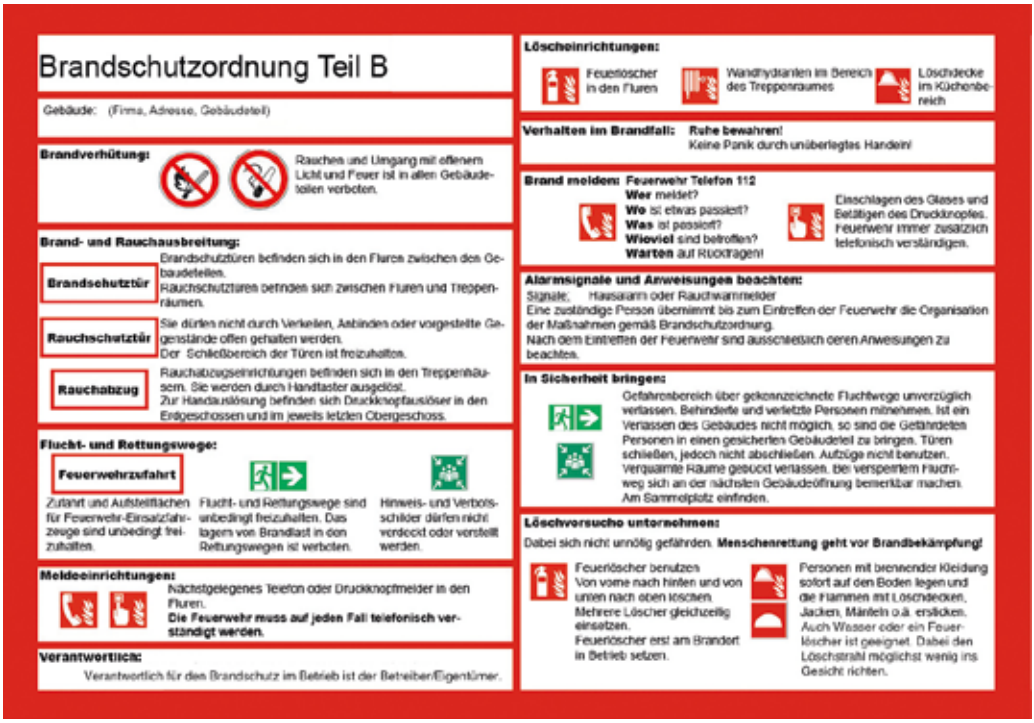
> § 10.2 German Occupational Safety and Health Act (ArbSchG) “First Aid and other immediate emergency measures”

1) The employer must take measures to ensure that first aid can be provided, fires suppressed and people evacuated in a manner and to an extent appropriate to the type of workplace, nature of operations and size of workforce. These measures must also take account of any other persons present. (...)

2) The employer must name the employees who are to carry out first aid, fight the fire and evacuate personnel. The number, training and equipping of said employees must be proportionate to the size of the workforce and any special hazards/ risks present. (...)

> Section 7.3 “Fire safety assistants” in Technical Regulations for Workplaces (ASR A2.2) “Fire-fighting measures”

> DGUV Information 205-023 “Fire safety assistants/Training and licensing”



2. Emergency call: 112

- Where is the fire?
- What is on fire?
- How big is the fire?
- How many people are injured or in danger?
- What hazards are posed by materials/machinery/plant?
- Wait for any questions from the fire brigade!

3. Checklist for fire safety assistants

- Put on your fire safety assistant jacket. Call 112.
- Check all areas. Do not leave anyone in the building.
- Lead people to the assembly point via signed escape routes.
- Try to close as many doors as possible behind you as you leave.
- If necessary, persons with physical disabilities should be evacuated along corridors and then down the stairwells.
- Try to tackle blazes using fire extinguishers and wall hydrants.
- Go only as far as the smoke. Do not put yourself in danger!

4. Principles of combustion

Combustion

... is a process, usually involving flames, by which a flammable material combines with oxygen and burns. This depends on the relative quantities of heat, oxygen and flammable material present.

Fotolia – © Anna Jurkovska

The denser the flammable material
... the worse it burns. The more delicate the material, the quicker it will catch fire. The energy needed to ignite logs is much greater than that needed to set light to wood shavings.

Oxygen
... is a colourless, odourless, tasteless gas that is not flammable on its own but is the element that causes oxidation to take place during the burning process. The higher the concentration of oxygen, the higher the flammability, the speed of catching fire and the temperature of the flames.

Heat (a.k.a combustion energy)
... is the decisive factor in the starting of a fire. Flammable materials in liquid form must reach a minimum 'ignition temperature' before they will burst into flames. This combustion energy need not be provided by a naked flame. Hot surfaces, combustion gases and radiated heat may suffice. When any material reaches its minimum burning temperature it will continue to burn on its own.

5. Dangers posed by fires

Smoke and toxic fumes
Fires generate large volumes of extremely toxic smoke very fast. It quickly spreads through the building, reducing visibility. Toxic fumes caused by fires can be broken down into three groups:

1) asphyxiating gases, e.g. nitrogen,
2) gases that irritate mucous membranes and airways, e.g. chlorine,
3) neurotoxins, e.g. CO and CO_2

Spreading of blaze – atmospheric factors

Measures must always be taken to stop a fire from spreading. People leaving the building should close any doors behind them. A fire door will normally prevent smoke as well as fire from spreading. Pipework and ducts can also help fires to spread, as can thermal conduction via materials or even heated air!

Spreading of blaze – mechanical factors

Another potentially lethal hazard is posed by flying shrapnel-type objects. Sealed receptacles (spray cans, gas bottles) may explode or an entire set of windows may shatter. Evacuees must therefore assemble at a point that is located at a safe distance.

6. Extinguishing fires

A fire depends largely on the relative quantities of heat, oxygen and flammable material present. At least one of these three factors must be removed if a fire is to be extinguished.

As the oxygen supply and flammable material are usually hard to remove, we must try to alter the temperature and change the proportion of the three elements.

Smother

Burning liquids are difficult to cool, so the only decision to take may be regarding the method of smothering the fire. Smothering can be done with a **blanket** or a **CO_2 extinguisher**.

Separate

Another way to reduce the amount of oxygen relative to the other two factors is to block it off from the flammable material. This can be achieved using a **foam extinguisher**.

Cool

A solid material on fire is usually glowing hot and giving off a lot of heat, so the focus should be on this, the source of the flames, rather than the flames themselves. Tackling the burning material will lower the temperature and minimise production of flammable gases. Use a **water** or **foam extinguisher**.

Anticatalytic method

Anticatalytic extinguishing disrupts the combustion process by preventing the formation of radicals. Use a **powder extinguisher**.

Classes of fire

Fires are classified according to the material on fire:

Class	Type
A	Solids (e.g. wood)
B	Liquids (e.g. petrol)
C	Gases (e.g. propane)
D	Metals (e.g. aluminium)
F	Fats (e.g. deep-frying)

Powder extinguishers, which are deployed for Class A, B & C fires, are in widespread use. Class D & F fires must be tackled with the appropriately marked extinguishers to prevent metal- and fat-based fire explosions!

Fotolia – © saelim

Use the extinguisher correctly

- Always spray in the direction that the wind is blowing to help the contents of the extinguisher reach the fire and to prevent flames blowing towards you.
- Tackle extensive blazes from the leading edge, starting at the lowest point.
- Tackle fires involving dripping or flowing materials from the highest point.
- If possible, use a number of extinguishers simultaneously.
- Monitor extinguished fires and be prepared to resume action if there is a renewed flare-up.
- Use the extinguisher until empty and have it refilled.

< *Dragging a casualty to safety*

7. First aid during and after fires

Rescue techniques

You may have to help people with limited mobility to leave the building – either by carrying the person (using a stretcher or rescue chair) or with 2 helpers supporting him/her under the arms. Another option involves

Dragging a casualty to safety

Approaching the casualty from behind, lift his upper body with your hands under his shoulder blades and your forearms cradling his head. Carefully lift the casualty into a sitting position, holding his shoulders and using your legs to prevent him from tipping to one side. Pull one of the casualty's forearms across his stomach. Then reach under and through his arms from behind, grasping the forearm with both hands. Your thumbs should be hooked forwards, over the upper side of the forearm, alongside your other fingers. If kneeling, come to your feet. Then lift the casualty and, with his bottom clear of the ground or even supported on your thighs, drag him to safety. One (or two) helpers should support the weight of his legs.

Putting out flames when person is on fire

Try to smother the flames with blankets, jackets, coats, water, fire extinguisher etc. Try not to direct a jet of water into the casualty's face.

Shock position
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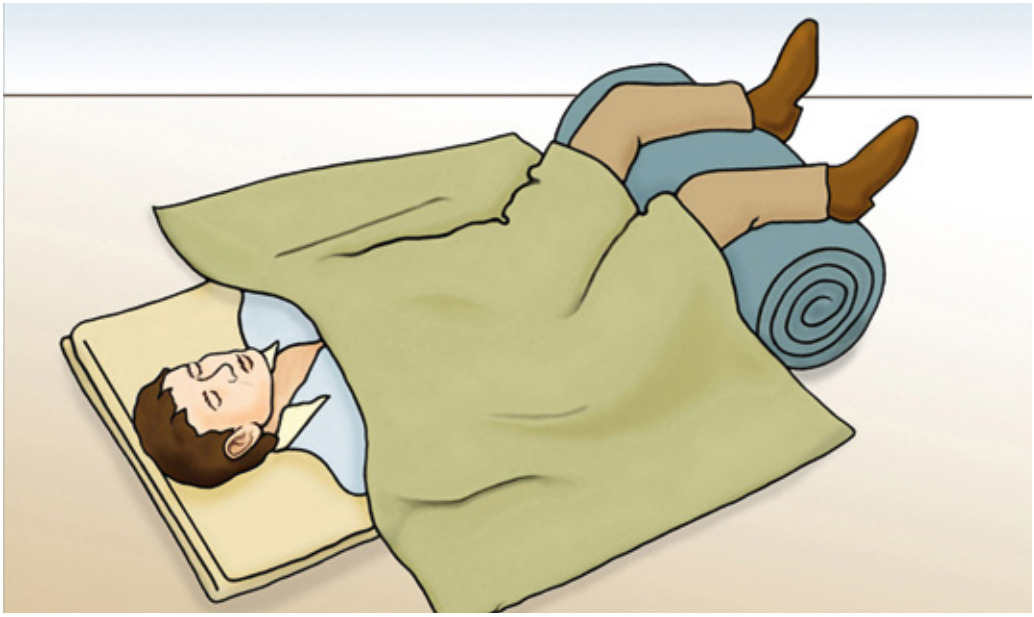

Fotolia – © Henrie

Treat burns

Do not pull off parts of clothes that have stuck to the body. Cool the burns immediately, applying clean, flowing water for up to 10 minutes, and then cover the area with a sterile dressing.

Treat for shock

Symptoms: weakness, pale, cold, clammy skin, chills, fear, confusion, nausea, apathy, agitation/hyperactivity

Action: Calm the patient, lay him down flat and cover him with a blanket. If there is no reason not to, raise his legs (resting them on a suitcase, rolled blankets, etc) to alleviate shock symptoms. Shock can be fatal!

Recovery position (if casualty is not responding)

If casualty is breathing **>** recovery position

IMPORTANT: Only put the unconscious person in the recovery position if she has resumed breathing after having her head tipped back. Once she is in the recovery position, carefully tip her head back again and check she is still breathing! The recovery position is designed to allow saliva and vomit to run out of the mouth.

Putting a person in the recovery position:

1) Kneel down alongside the casualty, pull his nearest arm out to the side and angle it upwards (like a cactus arm).

Putting a person in the recovery position
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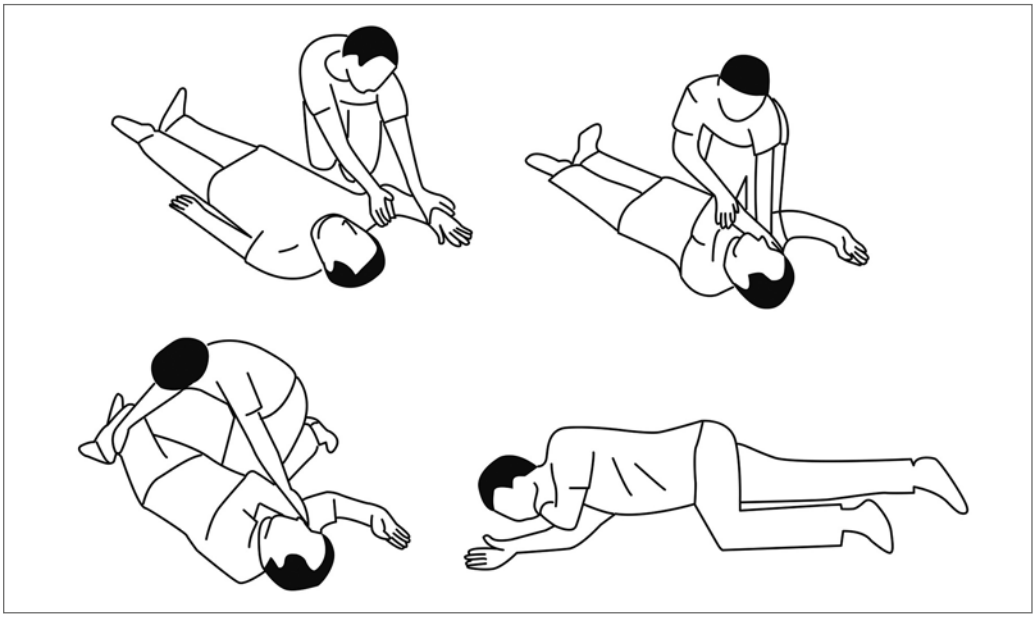

Fotolia – © Thomas Zagler

2) Pull his other arm over his neck, leaving the back of his hand touching his cheek.

3) Flex his furthest leg at the knee and, moving your hand onto the kneecap, pull and push down on the knee to roll him over so that his cheek ends up resting on the back of his hand.

4) It only remains to tip his head back, ensuring that his mouth is open and stays lower than his oesophagus, to allow fluids to drain out. Cover the patient with a blanket to prevent his body temperature dropping drastically.

IMPORTANT: In the recovery position, too, the person's breathing must be checked regularly.

Resuscitation

IMPORTANT: If we cannot get an unconscious person to breathe unaided, we must start cardiopulmonary resuscitation (CPR) immediately.

How to perform CPR: The casualty must be lying on his back on a hard surface. Clothing covering the chest should be opened or pushed up.

Heart massage (compressions): In heart massage the first aider applies rhythmic pressure to the breast bone, pressing the heart against the person's spine and thereby pushing blood around the body. Between each compression the heart fills with blood again.

Heart massage

© Erste Hilfe Station

- Kneel down beside the chest of the casualty.
- Open his upper-body clothing and locate the compression point.
- The compression point is in the middle of the chest between the nipples or slightly higher. Make sure that the area you are pressing on is hard (the breast bone (sternum)), otherwise you will be pressing too low down (on the stomach).
- Place the heel of one hand on the middle of the breast bone with the heel of your second hand on top.
- Pressure should be applied through the heels – not the palms – of your hands.
- Press vertically downwards!
- Your arms should be straight and locked rigid.
- Each compression should depress the chest by 5 - 6 cm in the direction of the spine.
- Release pressure completely between each compression.
- Work briskly, at a rate of 100 - 120 compressions per minute.
- Trained first aiders who know what they are doing should also give rescue breaths. In this case the procedure is 30 compressions followed by 2 rescue breaths.
- Helpers who are unsure of how to give rescue breaths or are reluctant to do so should focus solely on heart massage. Pumping is essential!