

OPERATIONAL HYGIENE FROM A PRACTICAL POINT OF VIEW

Two white water droplets of different sizes are positioned above the text.

Be
clean –
stay
healthy.

Operational hygiene: What does that mean?

The topic of operational hygiene has become increasingly important in recent years and has been discussed and researched more than ever before. As a manufacturer of protective clothing and technical devices, Rosenbauer is naturally also intensively involved in this.

This brochure is intended to inform and raise awareness about this often underestimated, but nevertheless no less important aspect of everyday firefighting.

Hygiene - a set of measures

"Hygiene" refers to the totality of all measures that serve to prevent disease and to maintain, promote, and strengthen health. In the context of firefighting, this means not only protection against harmful substances during deployment, primarily through respiratory protection and personal protective equipment (PPE), but also protection against substances that are hazardous to health after deployment.



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Findings from science and practice

What is shown in this brochure reflects the current state of knowledge and is intended to aid the optimization of common hygiene measures.

No tactical recommendations are described, but best practice experiences of our customers based on sound research and study results.

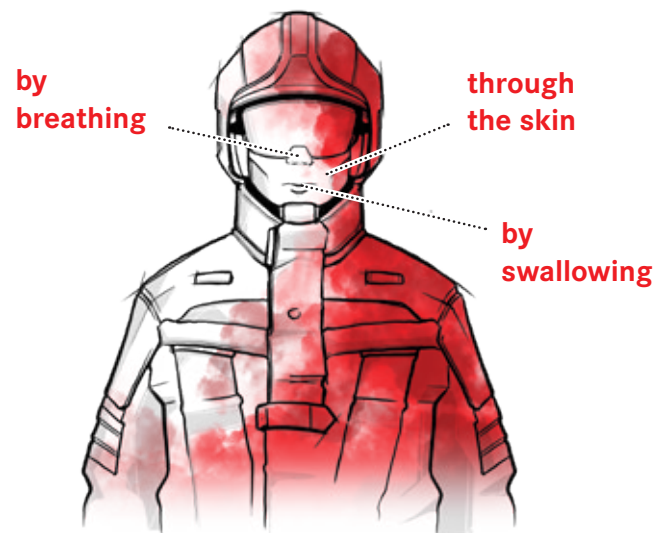
The aim of these descriptions is to correct the outdated image of the heroic firefighter in sooty protective gear, thereby significantly and sustainably improving the safety and health of all emergency personnel.

Harmful substances in use.

Contamination

"Contamination" is generally understood as the polluting of objects, rooms, water, food, or people with harmful substances. These include viruses, micro-organisms, biological toxins, as well as radioactive and chemical substances. Of particular relevance for fire departments, in addition to CBRN (chemical, biological, radiological, and nuclear) situations, is fire smoke - a mixture of burned materials and many different toxic by-products.

No fire takes place under perfect conditions. Therefore, elevated concentrations of harmful substances such as carbon monoxide, hydrogen cyanide and hydrogen chloride, hydrocyanic and hydrochloric acids, dioxins, furans, and polycyclic aromatic hydrocarbons (PAHs), as well as building and mineral materials, may occur. Depending on the substance, it may react in the human body in a way that is toxic to reproduction, mutagenic, carcinogenic, acute or chronically toxic, difficult to break down and/or can accumulate in the body.



Incorporation

"Incorporation" refers to the absorption of foreign substances into the body. This happens:

- by breathing in (inhalation)
- by swallowing (ingestion)
- through the skin (dermal absorption)

Due to various circumstances, incorporation of harmful substances may occur even with protective equipment. The aim of operational hygiene is to minimize the intake level.



Our tip!

Removing harmful substances

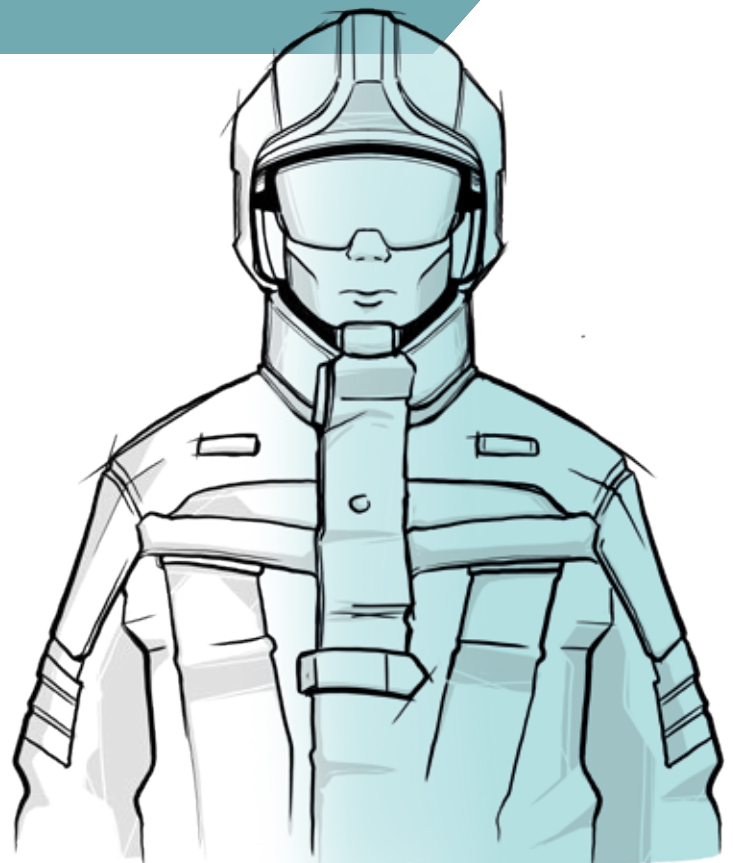
Effective decontamination begins with the immediate and practiced removal of protective clothing that are contaminated with harmful substances. This is immediately followed by personal cleansing. This minimizes the harmful substances released.

Decontamination

"Decontamination" refers to the removal of one or more harmful substances from a surface or even from the underlying layers. It is therefore the tool of choice in operational hygiene and consists of some elements and processes also known from CBRN decontamination.

Personal protective equipment, devices, and vehicles are decontaminated after use to prevent or maximally reduce potential contamination and hazards to emergency personnel.

Wearing self-contained breathing apparatus prevents inhalation and ingestion of harmful substances in the event of an emergency. Since micro-particles and gaseous substances are quite capable of penetrating breathable and thermo-regulating fire protective clothing, it is possible that these substances can be absorbed by the body through the skin.



The hygiene concept that works.

Important steps on the way to better operational hygiene.

In many fire departments, individual hygiene measures (boot washing facility, locker with separate compartments for operational and private clothing) or entire hygiene processes (cleaning and storage of PPE) are already firmly established. The aim of a local hygiene concept is the comprehensive consideration of all relevant areas as well as the combination and coordination of individual measures, taking into account the unique local circumstances and conditions.



Our tip!

Practical tips for implementation

- Both the management of the fire department and the executives must accept, support, and exemplify the concept.
- The more knowledge about and awareness of fire smoke hazards is provided, the more acceptable a concept will be with greater time, material, and personnel commitment.
- The consistent implementation of hygiene measures (even in small locations!) creates a different awareness of danger.
- In the fire department, solutions must be simple and practical.

The following aspects should be considered in a local hygiene concept:

- Organizational and structural separation of contaminated and clean areas at the fire station
- Establish measures for dealing with contamination from fire smoke or other harmful substances during standard operations
- Check whether existing or planned Hazmat vehicles and units can be used
- Integrate hygiene module(s) firmly into alarm and deployment scheme
- Documentation of all possible contaminations
- Establishment of a cleaning process of PPE and equipment
- Check cleaning process and quality of washing

Measures before, during and after deployment.

1

Preliminary work



- Create a comprehensive hygiene concept
- Integrate operational hygiene knowledge and hygiene concepts into training
- Train correct use of PPE and hygiene concept in practice
- Stock PPE including reserve
- Define and identify contaminated/clean areas (only enter recreation rooms and social areas in clean work clothing)

2

During deployment



- Vehicle positioning at the operational site taking into account wind and ventilation direction
- Close doors, windows, and equipment compartments of the vehicle if not immediately required
- Switch off the ventilation and air conditioning systems of the vehicles
- Whenever there is a fire, the attacking team must wear self-contained breathing protection
- If necessary, select lower-contamination operational tactics (fan, external attack, extinguishing lance, etc.)
- Establish standard procedure for dressing contaminated emergency personnel, not only for breathing apparatus wearers
- Have support forces ready with adapted PPE for undressing and coarse decontamination
- Set packaging and transport standard for contaminated PPE and devices
- Provide a change of underwear depending on the situation



Our tip!

Always have the FFP3 mask with you

For possible changes in the situation, equip all emergency personnel with a sealed FFP3 mask. If there is a change of wind, ventilation, or temperature, it can be put on immediately if the smell of fire smoke is noticed.

Practical tip documentation

For documentation of a possible hazardous substance contamination, e.g. the measurement protocol in NBC operations ('hazardous substance verification') is suitable. In addition, an entry in a database is useful to be able to determine a lifetime exposure in the long term, e.g. at the central exposure database of the DGUV. In any case, a note should be made in the personal respiratory protection record for all emergency personnel documenting as accurately as possible OF the potential exposure with a photograph and description.

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Immediately after deployment

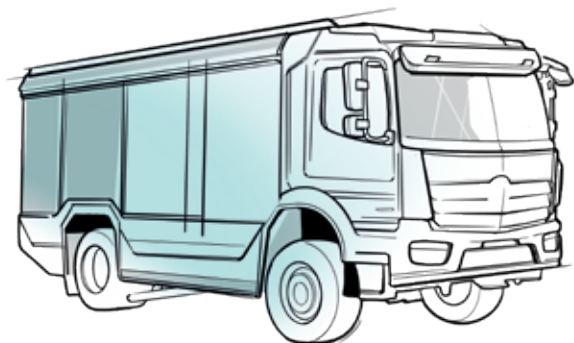


- Initial cleaning of contaminated personnel, washing of hands and neck/face, eating and drinking only after this has been done
- Take a shower as soon as possible to minimize the amount of PAHs absorbed through the skin
- Coarse cleaning of non-replaceable PPE (boots, where appropriate helmet, and gloves)
- Coarse cleaning of devices and vehicles, soaking of hoses if necessary
- Adjusted PPE during post-fire operations and walk-throughs at 'cold' operational deployment sites
- Provide documentary evidence of contamination (air measurement, wipe samples)
- Allow fire rooms to air out well (at least 1-2 hours)

4

Follow-up tasks

- Fine cleaning of devices and vehicles (exterior and interior)
- Preparation of respirators and PPE
- Complete verification
- Prepare exposure documentation



Safe undressing and body cleaning.



Take off PPE

- Immediately after leaving the smoke zone, allow slightly volatile smoke gases to vent for a few minutes
- Coarse cleaning of the operational deployment boots
- Take off work gloves, put on disposable gloves.
- Inhalation of contaminants can be avoided by wearing an FFP3 mask or by removing the respirator mask with attached regulator only after taking off the fire protective clothing.
- When removing contaminated clothing as well as emergency helmets, take care to avoid skin contact with contaminated materials.
- Pack PPE and contaminated equipment airtight in bags/containers.

Initial cleaning

- Wash hands thoroughly with soap, if necessary using a brush
- Clean face and ears with water, soap, or cleaning wipes
- Clean neck and throat
- If visible soiling/contamination is present, wash corresponding parts of the body
- Put on a change of clothing, depending on the operational situation
 - Reserve PPE for further work at the operational deployment site
 - Change of clothing/training suit for return trip to fire station

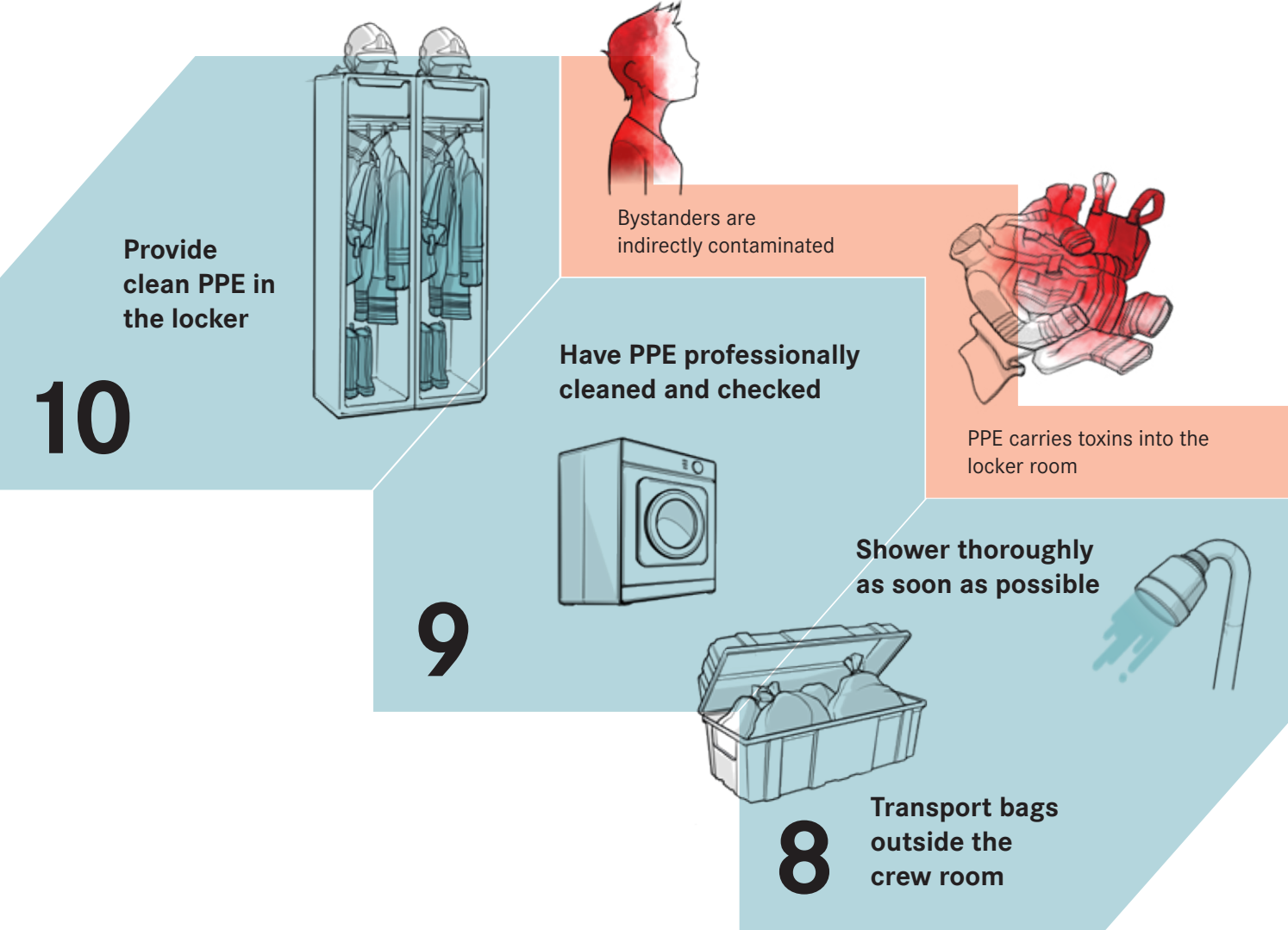


Showering

- Shower as soon as possible on site or at the fire station
- First take a cool shower and soap/scrub thoroughly (toxic particles are washed away while skin pores remain closed)
- Followed by a warm shower as desired

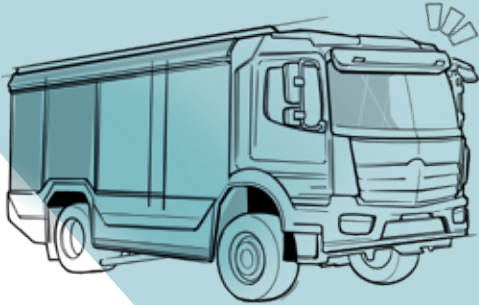


Clean mea



Drive to the deployment site

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Contamination by fire smoke and extinguishing agents

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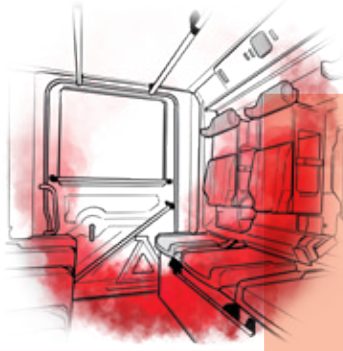
ns healthy.



Wearing contaminated PPE promotes ingestion of toxic substances

Change your way of thinking!

Remove contaminated clothing as soon as possible



Crew cab becomes permanently contaminated



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Wash the body first on site, put on clean clothing



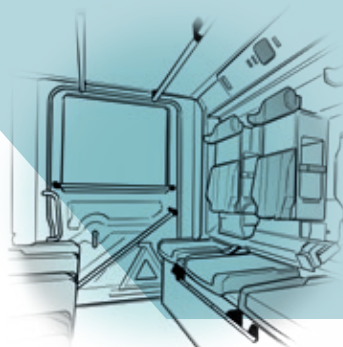
Crew cabin is not contaminated and remains clean



Pack contaminated PPE and devices in an airtight manner

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7



Safe handling of contaminated PPE and devices.

Packing and transporting

- Remove accessories (e.g. carabiners, lamps, etc.)
- Empty all pockets
- Pack accessories and bag contents in zip bags, clean or replace them yourself
- Close zippers and Velcro strips completely
- Place PPE parts in a laundry bag/container and label with documentation form
- Place breathing apparatus in another laundry bag/container and label with documentation form
- Seal bags airtight (using integrated tape or clamp)
- Transport to the fire station outside the crew cabin
- Placing the transport bags in the black area/dirty laundry room

Cleaning

- Cleaning of contaminated PPE only by trained specialist personnel of the fire department or a service provider
- Protection of personnel with FFP3 mask, disposable gloves, apron, and safety goggles
- Cleaning of textile PPE components in special industrial washing machines with firefighting programs and special detergent according to manufacturer's instructions
- Cleaning the helmet, gloves, boots, and breathing apparatus in appropriate automatic washers according to the manufacturer's instructions
- Drying and, if necessary, impregnation according to the manufacturer's instructions
- Check PPE and equipment parts for damage, initiate repair/replacement if necessary
- Washing documentation for clothing/devices
- Provide clothing as personal equipment or pool linen



Our tip!

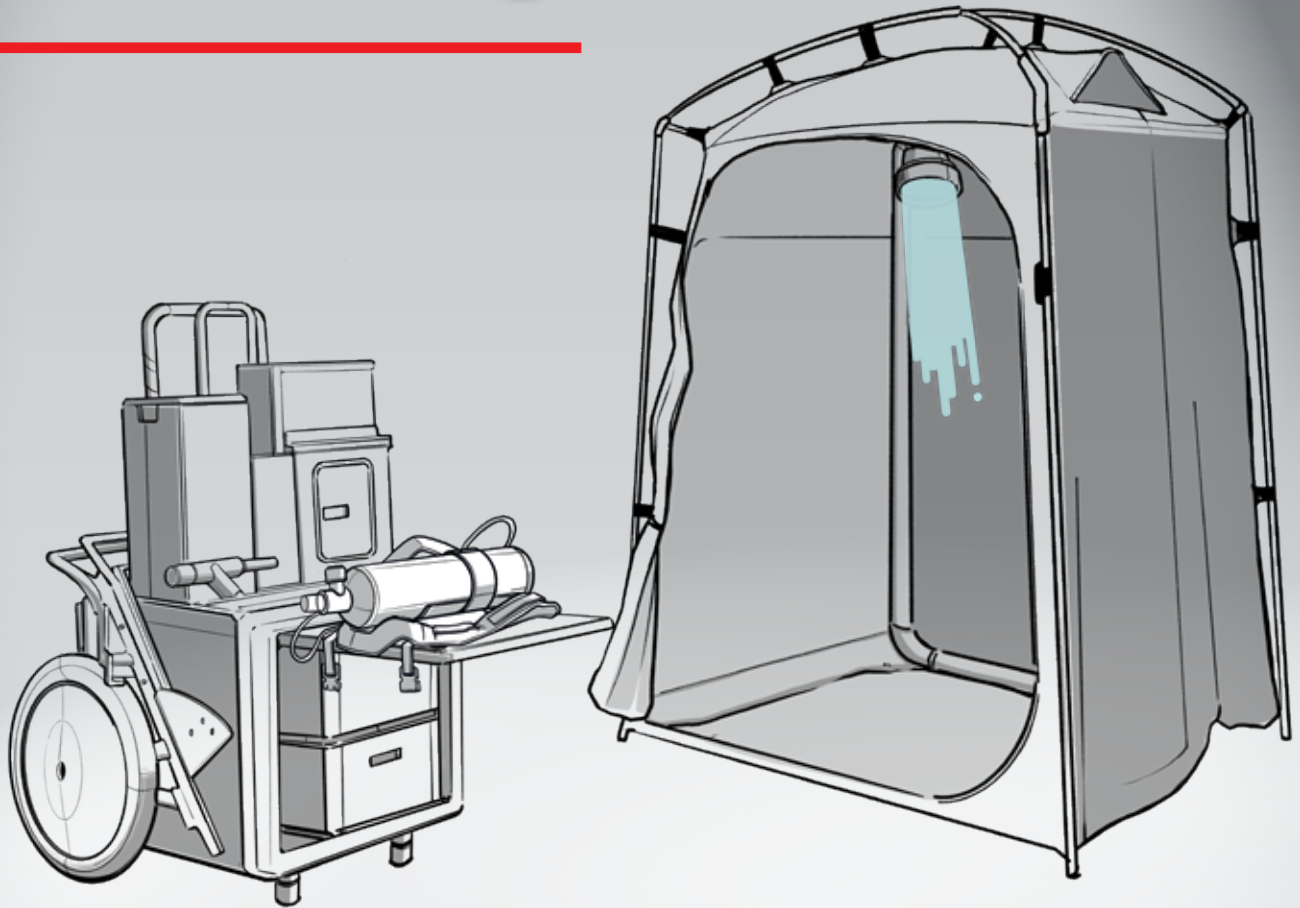
Laundry bag documentation form:

First and last name, personnel number, local fire department/guard, list of contents with inventory number if applicable, suspected contamination

Laundry bags:

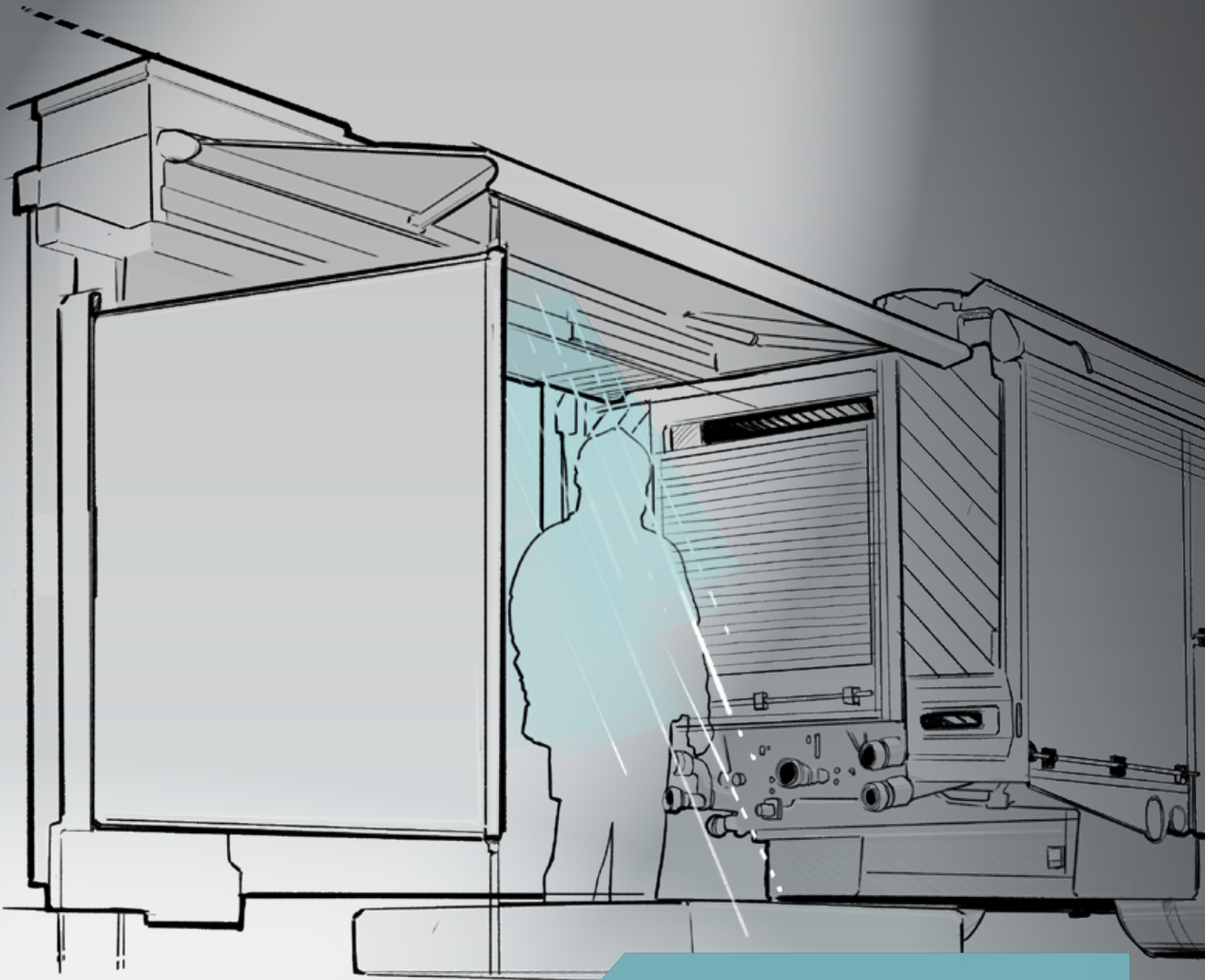
- Insertion window/attachment option for externally readable document slip
- Color system for disposable bags (blue = waste, black = dirty, red = contaminated)
- Benefit textile bag: co-washable, reusable, sustainable
- Benefit of hot water soluble disposable bag: water soluble from 60 °C, biodegradable

Change your way of thinking.



Create awareness for health.

Awareness of how to handle harmful substances will continue to change. Each and every individual is called upon to question and improve personal hygiene and protection measures during and after deployment. In order to achieve the lowest possible exposure to contaminants, changes in tactics and technology (external attack, ventilation, extinguishing lance, extinguishing robot, etc.), but also comprehensive documentation of the individual contaminations can make a contribution. Even simple measures promote the lifelong preservation of one's own health.



Willingness to learn and make progress

Furthermore, one thing is clear: progress and further development only come about through the willingness to learn and to implement and try out new ideas. Rosenbauer aims to actively contribute to the ongoing further development of the field of operational hygiene and health protection, as well as to producing technical and organizational solutions.

The starting point for this is always experience gained from the day-to-day work of fire departments all over the world, with whom Rosenbauer is in daily contact. For specific questions on the implementation of a technical solution, Rosenbauer's experts are of course available. Information and contact details can be found at:

www.rosenbauer.com/einsatzhygiene

For more operational hygiene.

From changing your way of thinking to specific products.

Hygiene reel with shower tent:
The compact one-person reel "Operational Hygiene" with shower tent enables a quick and easy setup of a shower facility (incl. hot water preparation) at the operational deployment site.





Our tip!

Our experts can advise you on specific questions relating to operational hygiene.

For information on Dekon products, the online store and the equipment catalog are also available.



Roll container "Operational Hygiene":
With the special design of the RTE RC Profile, a comprehensive cleaning and showering station can be set up on site in just a few steps.

PPE laundry bag:
The contaminated operational clothing can be easily and safely stored in the laundry bags and made ready for clean transport to the nearest cleaning facility.



