Quick guide: Safe and suitable firefighting

To ensure safe and suitable firefighting onboard ships, both equipment and tactics must be selected with care.

This quick guide is intended to help anyone responsible for the personal protective equipment (PPE) used during fire extinguishment on ships. The information is based on the results from the research project Safe and Suitable Firefighting, within which the greatest focus has been on the fire suits over other fire related PPE. The project also had a special focus on ro-pax ships, but many of the results are applicable for other types of ships as well.

FIRE SUITS: CONSIDER THIS

- Ensure that the suit is certified according to EN 469 and has the performance level 2 (see next page).
- Use a 'flash hood' to ensure that neck and head is protected. This item is not included in MED, so no Wheelmarked hoods are available on the market.

- Wear long sleeved clothing under the fire suit to ensure the best protection. Equip the fire station with *spare* undergarments for any firefighter wearing, for instance, a t-shirt.
- Wristlets with a loop around the thumb stop sleeves from going up, reducing skin exposure.

- Pre-bent knees and elbows improve the mobility.
- Knee pads allow crawling on hot or hard surfaces.
- Size and fit is important for full protection and usability. Female and male body proportions are different, so men's and female's sizes should be accomplished by individual patterns.

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Version: 01 (Published 2022)

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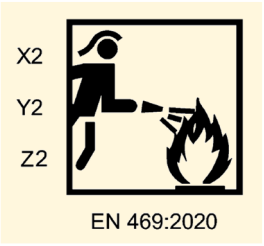
Wheelmarked fire suits

The Wheelmark is found on products that comply with the Marine Equipment Directive (MED). For fire suits, the Wheelmark means that the suit is certified according to one of three different standards. For most ship types, the fire suit should be certified according to EN 469:2020 and meet the performance requirements of level 2. This is the type of fire suits used by land-based rescue services in Europe. The two other certification standards are for aluminized suits, which have other purposes than normal firefighting, for instance quick recue operations during intense radiant heat conditions.



An EN 469-certified suit has a pictogram on the product label, which states what the performance level is. X2 means that the garment reaches level 2 for heat protection (combined protection against contact, flame and radiation heat transfer). Y2 means that the garment has a moisture barrier and that the water penetration resistance is ≥20kPa. Z2 means that the garment reaches level 2 for breathability.

Fire suits with performance requirements of level 1 (marked with X1/Y1/Z1) is normally not applicable for protection against risks encountered in fighting fires in spaces on a ship.

Contaminated fire suits

After a fire, it is very likely that the fire suits are contaminated. Include practicing of removing the fire suits safely in fire drills. Remove fire suits before SCBA and put the contaminated PPE in airtight bags. Do this outside and avoid skin contact or inhalation. Read more about this in the Skellefteå Model, linked below.

USEFUL LINKS

- Safe and Suitable Firefighting report
- List of testing standards for marine equipment
- International Association of Fire and Rescue Services
- Fighting fires in new energy carriers on deck, BREND 2.0 report & quick guide
- MSB: Healthy firefighers: the Skellefteå Model

EQUIPMENT: CONSIDER THIS

- Each firefighter must have their own communication device with microphone and speaker integrated in helmet or breathing mask. The device should also be IP rated.
- Use lightweight BA (breathing apparatus) cylinders over steel.
- Use flashlights that can be attached to, for instance, the helmet so that the firefighter can work with both hands.
- There are many things that can be useful during a fire onboard, such as laminated GA plan, fire plans pens, timers, wrenches, bolt cutter, crowbar and Thermal Imaging Camera, which could all be kept in bag(s) in the fire station.

- All this equipment (including communication devices) should be stored in the fire station, ready to bring along.

Alternative fuel vehicles

Available statistics today suggests that the likelihood of fires in AFVs is lower than for conventional vehicles. Both battery- and gas-powered vehicles are equipped with a range of safety systems, intended to protect them from fires, among other things.

However, fires in EVs can result in higher emissions of the toxic gas hydrogen fluoride (HF) compared to conventional vehicles, since HF is produced when li-ion batteries burn. HF gas is very dangerous to inhale, but studies outside Safe and Suitable Firefighting have shown that the risk for a potential skin uptake of HF is low. It is unlikely that adverse health effects are caused during smoke diving from HF for firefighters wearing full firefighting PPE.

Research on the possible consequences of fires in electric- and compressed gas-vehicles indicate that fire suits, approved according to EN 469 level 2 (together with gloves, boots, flash hood, long-sleeved undergarments and BA kit), provides a good protection against heat flux, temperature, and fire gases.

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