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Firefighter Protection



Guide to the care of firefighters' protective clothing



EN 2022

Protection



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The information provided in this leaflet is intended to advise you.
No binding force can be derived from these recommendations.

Guide for the Fire protection clothing



Foreword

This guide is intended for all interested users of protective clothing for firefighters, but especially for equipment supervisors or persons responsible for the care, maintenance and repair of the clothing.

Fire brigades use protective clothing in accordance with the EN 469 standard and the requirements profile according to the manufacturing and testing description for universal protective clothing for firefighters (HuPF). These garments require special care in order to remain serviceable for as long as possible. This guide is intended to help you with this.

In addition to the manufacturer's information enclosed with the garments and the identification label attached to the garment, this guide is intended to assist you in the effective and proper reprocessing of your protective clothing.

In order to achieve an optimal and hygienic cleaning effect while at the same time being as gentle as possible on the laundry, a constant reflective power of the reflective stripes as well as a high colour permanence of the outer material, only detergents that have been specially developed and tested for this area of application should be used.

Furthermore, in addition to the chemical parameters, the physical parameters, i.e. the process parameters, must also be taken into account. Only a correctly selected combination of time, temperature, mechanics and chemistry will lead to lasting success.

However, the clothing must not only be properly cleaned, but also periodically re-impregnated depending on the intensity of use.

The dirt-, water- and chemical-repellent properties of protective clothing are reduced by use and can be renewed by finishing with special fluorocarbon resins. The soaking of the outer fabric and thus the absorption of liquids into the clothing is reduced, the drying of the clothing is accelerated and the insulation is improved, especially when damp. This is particularly important in contact with heat and in winter.

The protective clothing essentially consists of the following materials:

- **Aramide fabric**
- **Climate membrane**
- **Reflex fabric**
- **Insulation lining**
- **Velcro fasteners**
- **Zips**

The care of Firefighters' protective clothing

Important basic information

Always wash protective clothing separately so as not to adversely alter the non-combustible or flame-retardant properties of the clothing. Do not wash with flammable materials to prevent flammable lint from adhering.

Do not wash clothes at home, contamination can be easily spread that way! Protective clothing should be professionally reprocessed by a service provider or at the fire station.

Always keep your clothing clean! Only clothing that is free of dirt, oil, grease and perspiration provides full protection, does not burn, is permanently waterproof and reliably transports perspiration to the outside.

If the garment is extremely contaminated with soot, oil and grease, pre-treatment (e.g. pre-wash) or chemical dry-cleaning is recommended.

Always wash protective clothing as soon as possible after use. Long storage times of soiled clothing lead to deteriorated cleaning results.

Attention Velcro damage! Severe damage to clothing is possible due to Velcro fasteners in the laundry! Therefore, all Velcro fasteners must be closed or covered. Furthermore, all buttons and zips, especially the front zip, must be closed.

Set width adjustments to maximum opening degree.

Be careful when clipping labels, do not damage the membrane!

Before washing, remove all detachable metal parts (e.g. snap hooks) and remove removable back labels and empty the bags.

Membranes in particular can be severely damaged by snap hooks or metal parts during the spin cycle!

If it is possible to separate the climate membrane and the insulation lining from the outer jacket, these parts should be treated with a separate washing process.



The machine technology

Protective clothing should be washed in freely programmable wet cleaning or washing machines with a capacity of at least 15 kg of fabric. These are optimally adjustable to the washing processes mentioned and recommended later.

The machine capacity may only be used to 75% in order to avoid too high a mechanical load during the washing treatment. As a guideline, leave at least two hand widths of free space above the laundry in the washing drum.

A professional tumble dryer must be available for drying. Time and temperature must be freely programmable. Sensor-controlled drying programs are not suitable for protective clothing.



The three steps of textile care:



1. Washing

Please be sure to check the care label before washing. If there are care symbols and instructions for a washing procedure other than the one described here, the latter must be used! The instructions in this brochure are then not valid or only valid to a limited extent.

During maintenance, the pH value in the wash liquor must be less than 9.

The use of household detergents and powder detergents is generally not recommended.

Fabric softeners, optical brighteners and bleaches must not be used.

For washing treatment we recommend **Viva Sensitive**.

Viva Sensitive is a sole detergent without bleach and optical brighteners, which is specially adapted to the needs of protective clothing.

The normal wash cycle should only be used in the first bath. For all the other baths use a gentle wash cycle with 15 seconds of drum movement and 15 seconds of drum standstill. The liquor ratio in both wash baths is 1:6. We recommend four warm rinse baths with a liquor ratio of 1:8 to remove all surfactants and alkali.

The 4th rinsing bath can be dispensed with if acidification is carried out in the 3rd rinsing bath.

Protective firefighting clothing can be washed at a maximum of 60 °C. If the protective clothing is repeatedly exposed to excessive washing temperatures, damage to the membrane and individual components cannot be ruled out.

The **Viva Lana / Viva Duox** process has a bactericidal, fungicidal and virus-inactivating effect in the washing process. It is suitable for chemo-thermal laundry disinfection in the areas of food, industry, household and public facilities. It is particularly suitable for sensitive goods such as personal protective equipment (PPE). The process is registered with the Robert Koch Institute (RKI) for effect area A+B and registered and approved by the Association for Applied Hygiene (VAH).



2. Finishing

Finishing with **Chemprotect FC** is applied after the washing treatment in the washing machine. Make sure that the following instructions are followed to achieve an optimal result.

The number and frequency of re-impregnations depends on the intensity of use of the clothing respectively on the water- and dirt-repellent effect still present. Fluorocarbon-equipment can be effectively reactivated by dryer treatments, which is why re-impregnation is recommended after an average of 3–5 washing and drying cycles.

Impregnating agents from spray cans must not be used.



The protective clothing to be equipped must be washed before treatment. Only clean, grease-free garments can permanently absorb the impregnating agent!

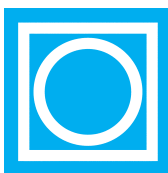
Care should be taken to ensure that there is no product residue left in the garments. This means that at least four rinses should be used when washing.

The 4th rinsing bath can be dispensed with if the 3rd rinse bath is acidified.

The fluorocarbon resin finish **Chemprotect FC** should be dosed with a dosing pump. If dosing is done by hand, e.g. via the induction fans, care must be taken that no detergent residues get into the finishing liquor. The specified dosing quantities must always be adhered to.

Heat the liquor to 35 °C and apply for 15 minutes to ensure even distribution of the impregnation chemical. Do not add any other washing, cleaning or care products to the finishing liquor.

For spinning, interval spinning is recommended for a maximum of 5 minutes in total.



3. Drying

Drying takes place in a dryer at a temperature of 80 °C. This corresponds to the care label dryer with two points.

Higher temperatures should be avoided, as some components of the protective clothing (reflective fabric, Velcro fasteners) may otherwise be damaged.

The higher the finishing temperature, the better the finishing effect and the durability of the finish. Always observe the care label in the respective garment. The drying temperature indicated there must not be exceeded, as this will damage the garment.

Testing the equipment by spraying water on it should only be done after the garment has cooled down, or better still after a few hours.

The use of tunnel dryers is discouraged.

After drying, a small amount of residual moisture may remain in the garment, especially in waterproof, multi-layer areas, such as under suction barriers.

It is therefore essential that the clothing is stored in an airy, dry place and protected from light.

The care of respiratory masks and

The care of respiratory masks



- The disinfection and cleaning of respiratory masks represents another area of application for a washing machine.
- Since these items are usually not only dirty but also contaminated, disinfection is unavoidable.
- For disinfection, only a listed product may be used in conjunction with a disinfection procedure adapted to this product.

In this guide, you will find a disinfection procedure recommended by the company Dräger recommended. The disinfection, like the care of the HuPF garments, takes place on a wet-cleaning or washing machine with a capacity of at least 15 kg of fabric.

- The respirators must be placed in special protective bags for treatment. These can be obtained from the relevant specialized trade.
- Care must be taken with the respiratory masks to ensure that during the treatment, the fabric is not subjected to too much mechanical action. Therefore, a liquor ratio of 1:5 must be used in the disinfection process.
- Furthermore, it must be ensured that no objects that could damage the respirators get into the washing machine.
- There shall be no piercing for marking purposes.



... chemical resistant suits



The care of chemical protective suits

For the care of chemical protective suits, very different procedures are recommended by the respective manufacturers.

To avoid damage to this high-quality protective clothing, we will put together a wet cleaning procedure tailored to your needs. However, for this we need the care instructions of the respective manufacturer.



Viva Sensitive

Viva Sensitive

4

Liquid sole detergent for delicate fabrics and PPE

- **Viva Sensitive** is used for the care of PPE made of aramid and other fibres with reflective fabrics. It is free from optical brighteners and bleaching agents and therefore does not lead to lightening of colours or colour shifts in high-visibility clothing.

Due to the low alkalinity, reflective materials are not impaired in their function.

- **Viva Sensitive** is tested for the care of:
 - Fire service clothing according to EN 469
 - Rescue service clothing according to EN 343
 - High-visibility clothing according to ISO 20471

In principle, **Viva Sensitive** can also be used for PPE not mentioned. If in doubt, check the protective function. It is essential to follow the manufacturer's care instructions.

Dosage recommendation:

Hardness range	Water hardness in nmol CaCO ₃ /l	1-Bath procedure	2-Bath procedure	
			1. Bath	2. Bath
1	<1,5 soft	5–15 ml/kg	5–15 ml/kg	4–7 ml/kg
2	1,5–2,5 medium	7–18 ml/kg	7–18 ml/kg	5–7 ml/kg
3	>2,5 hard	Water softening		

Chemical - Physical data:

Total alkalinity:	0,3 g/l	(1% solution)
Caustic alkalinity:	0,0 g/l	(1% solution)
pH-Value:	8,5	(1% solution)
Density:	1,015 g/ml	(20 °C)

Ecology:

Viva Sensitive is free from phosphates, chlorine, APEO, EDTA and NTA, and fulfils the requirement of the Detergents Regulation (EC No. 648/2004)



Storage conditions:

Store in a cool, dry place, protected from frost. Protect from direct heat and sunlight.

Max. storage time: 18 Month

Use biocides safely, always read the label and product information before use!

The information provided in this leaflet is intended to advise you. These recommendations are not binding. derived from these recommendations. For further information, please refer to safety data sheet.

Viva Lana

Liquid detergent for PPE

Properties:

Viva Lana is used for personal protective equipment and other special textiles. The focus is on high productivity combined with optimum fabric protection.

Viva Lana is used in combination with Viva Duox when a fast and safe disinfection of sensitive goods at low temperatures is required.

Listing	VAH	RKI*
Anwendungskonzentration: (g/l Flotte bzw. m/l Flotte)	2,0 g Viva Lana/l 5,0 ml Viva Duox/l	2,0 g Viva Lana/l 7,0 ml Viva Duox/l
Temperatur	40°C	40°C
Einwirkdauer	10 min.	10 min.
Flottenverhältnis	1 : 4	1 : 5

*Application submitted

Dosage recommendation:

Hardness range	Water hardness in nmol CaCO ₃ /l	1-Bath procedure	2-Bath procedure	
			1. Bad	2. Bad
1	<1,5 weich	5–15 ml/kg	2–10 ml/kg	3–7 ml/kg
2	1,5–2,5 mittel	7–18 ml/kg	5–10 ml/kg	4–10 ml/kg
3	>2,5 hart	Water softening		

Use biocides safely, always read the label and product information before use!



Chemical - Physical data:

Consistency:	homogeneous liquid
Total alkalinity:	0,15 g/l (1 % solution)
Caustic alkalinity:	n.a. (1 % solution)
pH-value:	~7,5 (1 % solution)
Density:	~1,02 g/ml (20 °C)

Ecology:

Viva Lana is free from chlorine, APEO, EDTA and NTA.

Storage conditions:

Store in a cool, dry place, protected from frost. Protect from direct heat and sunlight.

Max. storage time: 24 Month

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Viva Blue

Viva Blue

Washing booster, grease solvent and wetting agent for synthetic oils and greases

Viva Blue is designed for processing workwear and PPE with heavy oil contamination. The optimal temperature range is between 60 °C – 85 °C.

Dosage recommendation:

Per kg of dry laundry at a fleet ratio of 1:4

Hardness range	Water hardness in nmol CaCO ₃ /l	1-Bath procedure	2-Bath procedure	
			1. Bath	2. Bath
1	<1,5 soft	1–10 ml/kg	1–10 ml/kg	1–5 ml/kg
2	1,5–2,5 medium	1–10 ml/kg	1–10 ml/kg	1–5 ml/kg
3	>2,5 hard	1–10 ml/kg	1–10 ml/kg	1–5 ml/kg

Chemical - Physical data:

Total alkalinity:	0,0 g/l	(1 % solution)
Caustic alkalinity:	0,0 g/l	(1 % solution)
pH-value:	~ 8,1	(1 % solution)
Density:	0,98 g/ml	(20 °C)

Ecology:

Viva Blue is free from phosphates, chlorine, APEO, EDTA and NTA, and meets the requirements of the Detergents Regulation (EC No. 648/2004).

Storage conditions:

Store in a cool, dry place, protected from frost. Protect from direct heat and sunlight.

Maximum storage time: 24 Month



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For further information, please refer to safety data sheet.

Chemprotect FC

Emulsion for water, oil and chemical repellent protective equipment

Chemprotect FC is a fluorocarbon resin emulsion. It is suitable for all types of PPE made of synthetic and blended fabrics. Fire brigades use protective clothing in accordance with the EN 469 standard and the requirements profile according to the manufacturing and testing description for universal firefighters' protective clothing (HuPF). Chemprotect FC is ideally suited for the reimpregnation of this fire protective clothing.

Dosage recommendation:

Hardness range	Water hardness in nmol CaCO ₃ /l	Rinse
1–3	0 to over 2,5 soft to hard	40–50 (15–25)* ml/kg

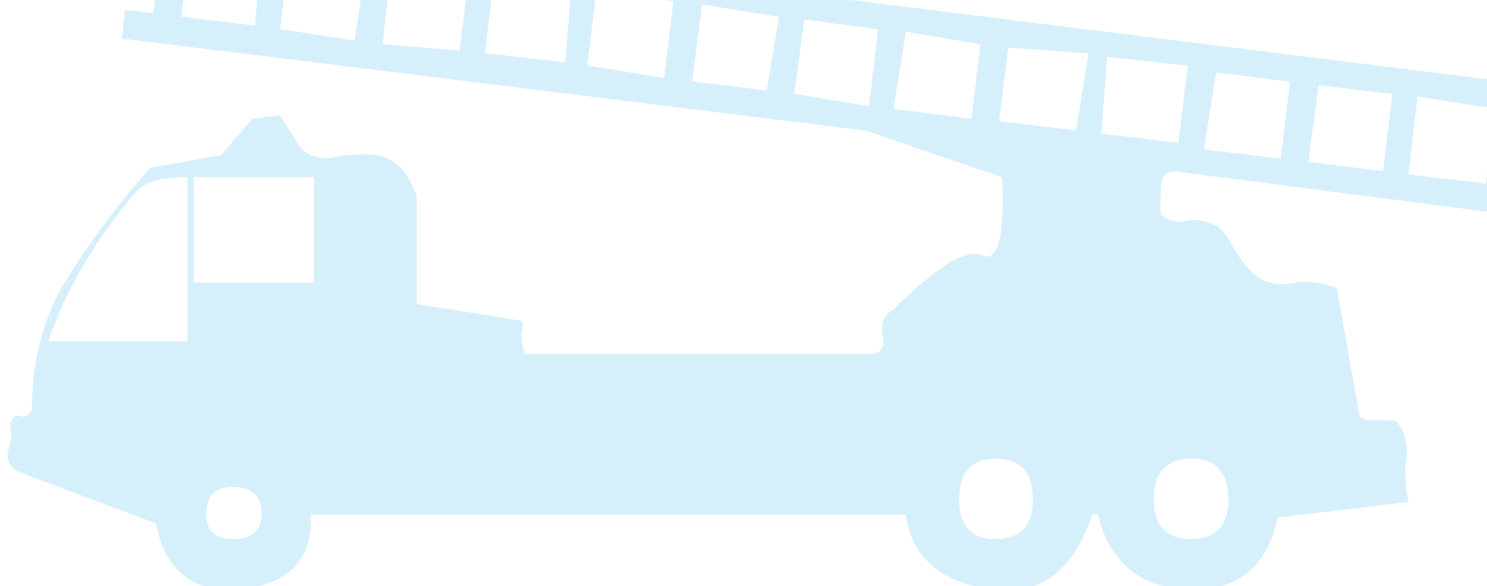
Application:

Before re-impregnation, the fabric must be well rinsed and alkali-free. It is recommended to acidify the last rinsing bath before finishing. The ideal pH value in the finishing bath is 4.0–5.0. Chemprotect FC is applied in the last rinsing bath. It should last 10–15 min at 35–40 °C. After pumping off, only a short spin at half speed is done.

In order to achieve a sufficient effect, drying between 80–150 °C must be carried out afterwards. For delicate textiles, pre-drying can be done first at lower temperatures and then fixed at higher temperatures.

It is essential to follow the care instructions of the manufacturer of the personal protective equipment.

As a rule, firefighters' protective clothing may only be dried at a maximum of 80 °C. The weakest link of the textile determines the maximum drying temperature.



Viva Duox

Viva Duox

Liquid bleach and disinfectant

Properties:

- **Viva Duox** acts as an effective bleach and disinfectant even at low temperatures and is gentle on colours and fibres. The high oxygen surplus enables very inexpensive bleaching and disinfection processes.
- **Viva Duox** may only be used on textiles without a bleaching ban.
- Together with **Viva Lana**, **Viva Duox** is registered with the RKI for chemo-thermal laundry disinfection in accordance with §18 of the German Laundry Disinfection Act (area of effect AB, bactericidal, fungicidal and virus-inactivating effect). Registered and approved by the Association for Applied Hygiene (VAH).

Dosage recommendation:

Listing	VAH	RKI (Area of action AB)*
Application concentration: (g/l Fleet bzw. m/l Fleet)	2,0 g Viva Lana/l 5,0 ml Viva Duox/l	2,0 g Viva Lana/l 7,0 ml Viva Duox/l
Temperature:	40°C	40°C
Exposure time:	10 min.	10 min.
Fleet ratio:	1 : 4	1 : 5

*Application submitted

Use biocides safely, always read the label and product information before use!



Chemical - Physical data:

Total alkalinity:	n.a.	(1 % solution)
Caustic alkalinity:	n.a.	(1 % solution)
pH-value:	< 1	undiluted
Density:	1,15 g/ml	(20 °C)

Ecology:

Viva Duox is not subject to the Detergents Regulation and (EC No. 648/2004). Avoid entry into the environment. Do not allow undiluted product to enter drains.

Storage conditions:

Store in a cool, dry place, protected from frost. Protect from direct heat and sunlight.

Maximum storage time: 24 Month

Deinfection- and cleaning agents for respiration masks.

- **Safe disinfection** Safe disinfection at 60 °C, user-friendly formulation without aldehydes due to the patented active ingredient Glucoprotamin®
- **Effective cleaning** Surfactant-free, pH-neutral, therefore particularly low-foaming, very good material compatibility, strong cleaning power

Optimally matched formulation components.
Sekumatic® FDR fulfils the requirements of the "AK-BWA".

Chemical - Physical data:

pH-value (concentrate):	ca. 5,5	(20 °C)
pH-value (solution, 5–10ml/L in DI water):	6–8	(20 °C)
Density:	1,03 g/ml	(20 °C)



Application:

Sekumatic® FDR

1. Warming-up and pre-cleaning step: At a drum speed of max. 20 rpm (water inflow and heating up to 60 °C) for 20min.
2. Cleaning and disinfection step: At least 5 min at a drum speed of max. 20 rpm.
3. Rinse step: (corresponding to four rinse cycles). At a drum speed of approx. 20 rpm for 40 min. at temperatures of (20 ± 5) °C.

Dosage recommendation:

Sekumatic® FDR

Add 10ml/L of the cleaning and disinfecting agent (1% solution) **Sekumatic® FDR** to the washing machine (Dräger part number: 79 04 059). This must be allowed to act on the respirator for 5 min at a temperature of 60 °C.

Composition:

Non-ionic surfactants, alcoholic solvents, complexing agents, corrosion inhibitors.

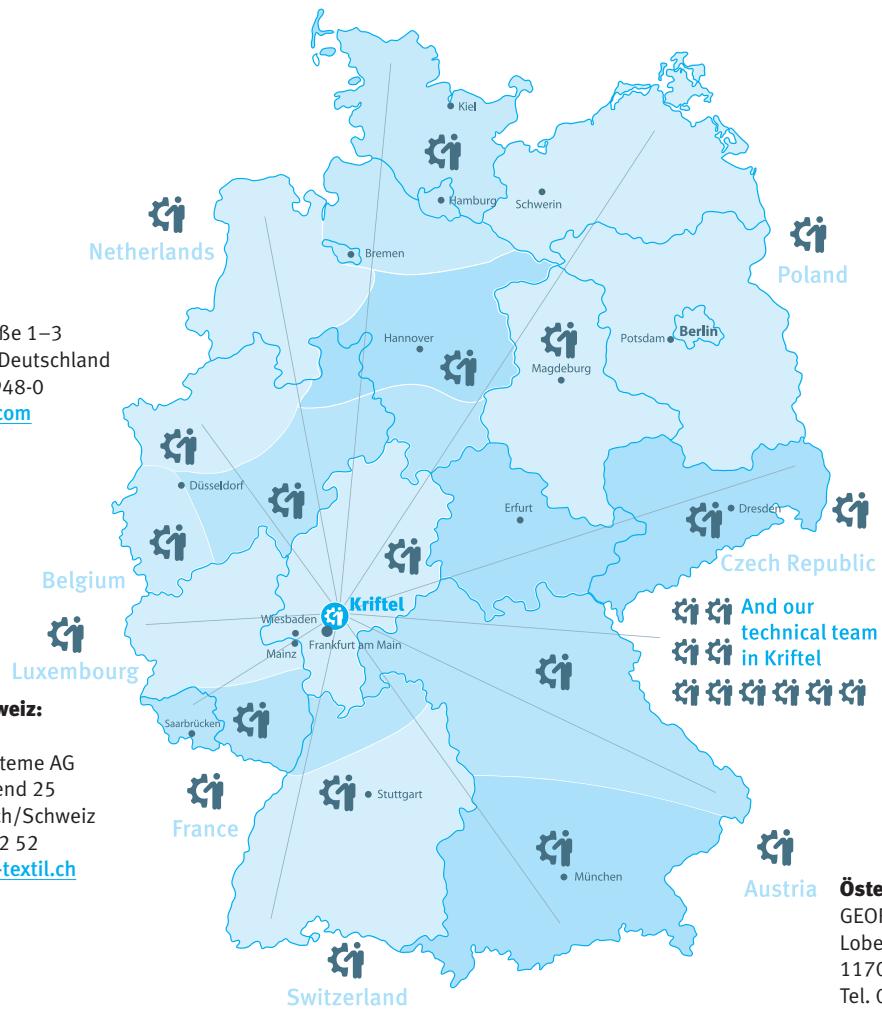
In 100 g active ingredients are contained: 2.0 g Glucoprotamin®, 2.0 g poly(oxy-1,2-ethanediyl,) alpha-[2-(didecylmethyl-ammonio) ethyl]-omega-hydroxy-, propanoate (salt), 0.75 g benzalkonium chloride.



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Guide to the care of firefighters' protective clothing

Innovations since 1885

In constant development for our customers



Good to know:

We provide detailed information on the properties and use of our individual products in the form of technical data sheets and separate brochures. Our application technicians as well as the field staff will also be happy to advise and support you on the phone or on site. In tricky cases, we are at your disposal with competent advice and help in the form of textile and laboratory tests.

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USE BIOCIDES SAFELY,
ALWAYS READ THE LABEL AND PRODUCT
INFORMATION BEFORE USE!