



INSTRUCTIONS FOR USE PERSONAL PROTECTIVE EQUIPMENT (P.P.E.)

Read these instructions carefully before using this clothing. Refer to your safety engineer or manager regarding the appropriate clothing for your specific work situation. Keep these instructions carefully so you can refer to them whenever you wish.

Declaration of conformity for this P.P.E. and more comprehensive instructions for use: see <http://sio.to/eudoc>



This item complies with the fundamental requirements of European Regulation 2016/425 on personal protective equipment (P.P.E.) based on European harmonised standard(s); you will find corresponding pictograms and protection classes on the label sewn into this garment.



This item complies with the fundamental requirements of the Personal Protective Equipment Regulations (Regulation (EU) 2016/425) as they apply in GB, as amended, based on designated standard(s) and/or technical specification(s);

Except for clothing that is only labelled EN 343 and/or EN 14058 and/or EN 13758-2 (and is covered by self-certification, with exception of $R_{ct} > 0.25 \text{ m}^2 \text{ K/W}$), all our other P.P.E. covered by this manual has been certified by Centexbel, Technologiepark 70, B-9052 Zwijnaarde (Belgium) - NB 0493. Clothing covered by this manual that is labelled with the UKCA pictogram has been certified by approved body Centexbel International Ltd., 8 Northumberland Avenue, London WC2N 5BY, UK - AB 8515. If this number 0493 or 8515 is shown on the right next to the CE or UKCA pictogram on the label sewn into the garment, it means that it is category III P.P.E. of a complex design that is to protect the user against hazards which are fatal or which can seriously and irreparably impair one's health, and the quality assurance monitoring of the manufacturing process is carried out by Centexbel.

This P.P.E. complies with General Standard EN ISO 13688:2013 / EN ISO 13688:2013+A1:2021. This P.P.E. complies with the REACH Regulation and does not contain any substances known at this time to cause allergic reactions or which are known to be carcinogenic or mutagenic. As with all

P.P.E., this product does not protect you against all risks! Check your specific risk assessment.

This P.P.E. will also be worn combined with other P.P.E. (including non-clothing P.P.E.). Check the compatibility and correct use when combined with other P.P.E.. Read the manuals of other P.P.E. as well.

With regard to protection against rain, cold, chemicals, fire, heat, etc. it is self-evident that you will only be protected on the parts of the body covered by the P.P.E. when performing activities and movements. As it is possible to combine different garments, you need to ensure that all parts of the body are covered with the appropriate levels of protection.




Making alterations to this clothing (without authorisation from Sioen) is not permitted! For optimum and compliant protection, you need to close all fasteners.

Never wear a damaged garment. A damaged garment must be taken out of use immediately and either repaired or replaced. Notify your manager at once. At 'end of life', this garment must be collected, removed and processed in controlled conditions (professional collection service for mechanical or thermal recycling, etc.) in a specialised facility. Sioen has no obligation or responsibility for taking back the P.P.E. for safe disposal.

We recommend professional care (via an in-house or external laundry). Specific care instructions for commercial laundries are available from Sioen upon request or on the Sioen website <http://sio.to/eudoc>. Care instructions for domestic laundering (which can also be done at a commercial laundry!) appear on the label sewn into the garment.

You will find a more detailed explanation of these symbols on the Sioen website <http://sio.to/eudoc>.

Please contact your Sioen dealer in all cases for more information about care instructions, repairs and safe destruction methods.

Label	Clarification
MAX	Maximum (theoretical) number of cleaning cycles means certification testing to be carried out after x cleaning cycles.
	Expiry date or 'do not use after' date.
	Certification tests carried out after an industrial laundry process (see http://sio.to/eudoc).
	The values entered in A, B, C are the corresponding body measurements (in cm) for which this garment is suitable. You will find the various sizing tables on our website see http://sio.to/eudoc . (A: Waist girth - B: Chest girth - C: Length)

Do not allow your garment to become too soiled. **Soiled clothing can result in reduced protection.** Chemicals (including their long-term effect due to clothing being put away soiled) can impair the protective properties of the clothing.

When picking up your clothing check that you have the right size and that there is no visible damage in evidence.

As a general rule, garments should be selected in such a way that the work can be carried out comfortably and unhindered.

Manufacturing traceability

The requisite details are shown at the bottom of the label.

Storage instructions

When you are not wearing the garment, you should store it dry, uncompressed, in a well-ventilated room. Avoid extreme temperatures and avoid direct sunlight to prevent colour changes. Complaints about colour changes will not be considered.

Sioen cannot be held liable for damage occurring as a result of improper use of the P.P.E. or any use that does not comply 100% with the instructions for use set out above.

EN 469:2005 +A1:2006

Protective clothing (intervention clothing) for fire brigades



EN 469

The concept of this suit is based on the application of multiple layers:

- An outer layer that protects against flames and protects subsurfaces against mechanical or thermal damage, among other things.
- A 2nd and possibly 3rd layer as thermal protection prevents burns. In the case of a Y2 labelled garment, a waterproof/breathable membrane is also provided.

Explanation pictograms

(the achieved classes of your garment can be found on the sew-in label.

Protective clothing with reference Xf, Xr, Y, Z

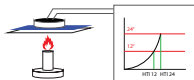
X Heat transfer: 'Flame test' and 'Radiation test'.

Xf = Flame (*EN 367 / ISO 9151*)

This test (strong flame: a heat flux of 80kW/m²) simulates a situation wherein the wearer has direct contact with flames for a short period of time.

	<u>Xf1</u> : Performance level	<u>Xf2</u> : Performance level
HTI ₂₄	≥ 9 s	≥ 13 s
HTI ₂₄ - HTI ₁₂	≥ 3 s	≥ 4 s

- HTI_{24} = the time it takes for the temperature on the inside of the jacket to rise by 24° (2nd degree burns).
- HTI_{12} = the time it takes for the temperature on the inside of the jacket to rise by 12° ('the pain threshold').
- $HTI_{24} - HTI_{12}$ indicates the reaction time to escape.



Xr = Radiant heat ([EN ISO 6942](#))

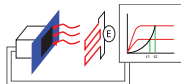
The test tool emits a strong radiant heat (40 kW/m^2).

	Xr1: Performance level	Xr2: Performance level
$RHTI_{24}$	$\geq 10 \text{ s}$	$\geq 18 \text{ s}$
$RHTI_{24} - RHTI_{12}$	$\geq 3 \text{ s}$	$\geq 4 \text{ s}$

The test defines:

- $RHTI_{24}$ = 2nd degree of burns
- $RHTI_{12}$ = the sensation of pain

$RHTI_{24} - RHTI_{12}$ indicates the reaction time to escape.



Y = Penetration of water ([EN 20811](#)).

- Level Y1 < 20 kPa (< 2 metres water column)
- Level Y2 $\geq 20 \text{ kPa}$ (≥ 2 metres water column)

Garments that have reached level 1 in resistance to water penetration should not be used when there is risk of water penetration.

Z = Water vapour resistance ([EN 31092](#))

- Level Z1 > $30 \text{ m}^2\text{Pa/W}$
- Level Z2 $\leq 30 \text{ m}^2\text{Pa/W}$

The lower the resistance value, the more the suit allows for perspiration to pass through.

Important: Thermal insulation can be adversely affected by the presence of moisture (perspiration, water, ...) in the intervention clothing!

EN 469:2020

Protective clothing (intervention clothing) for fire brigades



EN 469

The concept of this suit is based on the application of multiple layers:

- An outer layer that protects against flames and protects subsurfaces

against mechanical or thermal damage, among other things.

- A 2nd and possibly 3rd layer as thermal protection prevents burns. In the case of a Y2 labelled garment, a waterproof/breathable membrane is also provided.

Explanation pictograms

(the achieved classes of your garment can be found on the sew-in label.

Protective clothing with reference X, Y, Z (EN 469 : 2020)

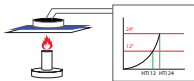
X Heat transfer: 'Flame test' and 'Radiation test'.

Xf = Flame (EN 367 / ISO 9151)

This test (strong flame: a heat flux of 80kW/m²) simulates a situation wherein the wearer has direct contact with flames for a short period of time.

	X1: Performance level	X2: Performance level
HTI ₂₄	≥ 9 s	≥ 13 s
HTI ₂₄ - HTI ₁₂	≥ 3 s	≥ 4 s

- HTI₂₄ = the time it takes for the temperature on the inside of the jacket to rise by 24° (2nd degree burns).
- HTI₁₂ = the time it takes for the temperature on the inside of the jacket to rise by 12° ('the pain threshold').
- HTI₂₄ - HTI₁₂ indicates the reaction time to escape.



Xr = Radiant heat (EN ISO 6942)

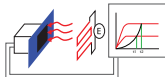
The test tool emits a strong radiant heat (40 kW/m²).

	X1: Performance level	X2: Performance level
RHTI ₂₄	≥ 10 s	≥ 18 s
RHTI ₂₄ - RHTI ₁₂	≥ 3 s	≥ 4 s

The test defines:

- RHTI24 = 2nd degree of burns
- RHTI₁₂ = the sensation of pain

RHTI₂₄ - RHTI₁₂ indicates the reaction time to escape.



X2 (EN 469:2020) => contactheat (EN ISO 12127-1, 250°C) ≥ 10 s

Y = Penetration of water ([EN 20811](#))

- Level Y1 < 20 kPa (< 2 metres water column)
- Level Y2 ≥ 20 kPa (≥ 2 metres water column)

Garments that have reached level 1 in resistance to water penetration should not be used when there is risk of water penetration.

Z = Water vapour resistance ([EN 31092](#))

- Level Z1 > 30 m²Pa/W
- Level Z2 ≤ 30 m²Pa/W

The lower the resistance value, the more the suit allows for perspiration to pass through.

Important: Thermal insulation can be adversely affected by the presence of moisture (perspiration, water, ...) in the intervention clothing!

Restrictions

This is not [EN 1486](#) reflective ('aluminised') clothing for specialised firefighting.



Unless [EN ISO 20471](#) is labelled, this P.P.E. only offers a basic visibility in accordance with [EN 469](#) Annex B with a limited surface area of fluorescent (day-visibility) and retro-reflective (night-visibility) material (if visibility bands are present).

If there is a risk of collision (public road intervention, etc.), additional signalling clothing in accordance with [EN ISO 20471](#) and local regulations must be worn. However, this additional signalling clothing may **never** be used for firefighting.



Provided it has a good repellent finish (see § Maintenance clothing), this clothing only offers basic protection against accidental splashes of liquid chemicals (water-diluted acids or bases and non-hazardous chemicals). Chemically contaminated clothing must be washed immediately. Certain contamination (e.g. oil, ...) can also negatively influence the flame retardant properties of the materials.

This is **not** a chemical protective clothing according to [EN 14605](#) or [EN 943](#) !



This clothing offers absolutely **no** protection against the cutting of chainsaws, rescue saws or -discs or other hydraulic rescue equipment.

For protection against chainsaws, P.P.E. should be worn according to [EN 381](#) or [EN ISO 11393](#).



This P.P.E. is **not** electrically insulating and is not intended for working on live electrical installations. Although the multi-layer clothing would

provide a basic protection for the thermal effects of an electric arc, this clothing is **not** IEC 61482-2 certified for protection against electric arcs.



This clothing has **no** inherent buoyancy and is therefore **not** a floatation aid. There are EN ISO 12402 certified P.P.E. for work in and near water. It is important to test the compatibility of a life jacket with the intervention clothing. Air present in the intervention clothing can interfere with the proper functioning of a life jacket.



This clothing will **not** protect you from radioactive radiation. In combination with a complete set of P.P.E. (gloves, fire fighting boots, helmet, compressed air), and if properly sealed, this will give you a very limited basic protection against accidental limited radioactive contamination, but this P.P.E. was **not** tested nor certified for this.

If Y2 labelled: the membrane of this clothing has been tested for its resistance to blood-borne pathogens, and it is **not** protective clothing against biological agents (pathogens viruses, bacteria, ...).

Use

This garment protects the torso, neck, arms (jacket) and legs (trousers) of the firefighter, but not the head, hands and feet. This garment provides protection during firefighting operations and related activities such as rescue work, disaster relief, This garment is not intended to offer protection during chemical or gas cleaning operations.

Compliance with EN 469 only applies if the intervention jacket and trousers are worn in combination, if the correct size is chosen (see § Sizes) and if the adjustable parts are correctly adjusted (see § Commissioning).

If jacket and/or trousers are only labelled Xf1 and/or Xr1, they **must** be combined with the correct other layers of clothing (as indicated on the label) to get an Xf2 and/or Xr2! (indoor firefighting).

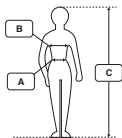
The user of this suit may not make any changes to the clothing.

For firefighting operations this clothing should always be worn in combination with other compatible (please check) P.P.E.: possibly fireproof underwear, helmet (EN 433), compressed air equipment and mask, fire fighting gloves (EN 659), firefighting boots/shoes (EN ISO 20345), fall protection (harness) when working at height, possibly a balaclava (EN 13911), P3 mouth mask, Read thoroughly the information brochures of each of the P.P.E.'s and the equipment you will use!

We would like to draw your attention to an informative Technical Report CEN/TR 14560:2018 concerning the selection, use, cleaning and maintenance of clothing that protects the firefighter.

Correct size selection

In this manual, we limit ourselves to the size table below (body measurements of the corresponding wearer; in mm). There is also a wearer trial set, with specific advice, available from Sioen.



For optimal protection, you must strictly follow the following guidelines:

1. Make sure that the size of the garment fits you.
2. The firefighter's clothing should not "stick" to your body ;
3. It can be a little wider because each layer of air helps to insulate.

A = Waist girth / B = Chest girth / C = Total body length

Main sizes (width)

Size	Jacket chest girth (cm)	Trousers waist girth (cm)
XS	78 - 86	66 - 74
S	86 - 94	74 - 82
M	94 - 102	82 - 90
L	102 - 110	90 - 98
XL	110 - 118	98 - 106
2XL	118 - 129	106 - 117
3XL	129 - 141	117 - 129
4XL	141 - 153	129 - 141
5XL	153 - 165	141 - 153

Main sizes (Length)

Size	Height (cm)
Extra short	156 - 164
Short	164 - 172
Regular	172 - 180
Long	180 - 188
Extra long	188 - 196

Note: Other specific size tables may be applicable.

Base your 1° fitting attempt on your chest girth and then the body length for the jacket; and on waist girth and then body lengths for the trousers.

If necessary, you can make a 2° fit attempt with a wider/narrower and/or longer/shorter size. Also check the length of your braces. The length of the brace was graded with the size. It is important that the back part - after adjusting the elastic adjustment - is in the right and comfortable position.

Verify that P.P.E. (jacket, trousers, boots, gloves, etc.) cover the body completely both when stationary and when moving. When standing up, the coat and trousers should ideally overlap each other by about 30 cm. A few light exercises (e.g. putting arms above head, bending forward) will clearly indicate whether the garment fits perfectly. When lifting the

arms it is important to pay attention to the length of the sleeve and the overlap between the jacket and the trousers; when bending forward it is especially important to check the overlap between the jacket and the trousers.



Commissioning

This P.P.E. Cat. III may only be used by wearers who have received the necessary training and guidelines to wear this garment in a variety of (often dangerous) tasks.

The user must also be provided with information on the other P.P.E. he is carrying, on the specific task for which he is assigned and on the limits to the use of these P.P.E. e.g. in the event of an accidental splash of chemical or flammable liquids on the garment, immediately remove the garments, after which they will be cleaned or taken out of service (see below).

Inspect your garment upon receipt. Read the manual.

Trousers

1. Insert the ergonomically preformed removable knee-pads if they are supplied separately.
2. Put the straps on correctly. Press hard on the touch and close fastener. Adjust it to the correct length using the buckles on the front.
3. After commissioning, the trousers will normally be folded on and over the firefighter's boots so that the boots are 'ready to go' and the trousers can be easily pulled upwards. In other words, it is not intended that one puts on the pants with firemen's boots through the legs.
4. Pull the trousers to waist height, close them, pull the braces over the shoulders and adjust them, making sure the shoulder piece on the back is in the right place. For optimal movement, check that the waist of the trousers fits your own waist (adjust-

able with adjustment system).

5. The hem of the trousers should be low enough to ensure good protection of the lower legs. Then put on the intervention jacket.

Jacket

1. The jacket is worn on top of the trousers with closed zippers. All closures are fastened, especially around the neck. Put the collar upright.
2. The jacket may have an anti-panic zipper, which means that if you need to take it off very quickly (e.g. in a safe environment after a dangerous contamination or after rescue from a flashover incident, ...), you only need to give a short upwards move/pull to the zipper closure (which is closed to the top). As a result, the jacket instantly opens up in full, and the user can throw the jacket on the floor. To be able to use the jacket again (and to close it normally), make sure that the puller of the zip is completely down of the fully opened jacket.
3. Inspect the other P.P.E. according to their manual and instruction guidelines. Make sure the jacket is compatible with the gloves. Short gloves are worn inside the sleeve end and then fastened to the sleeve hole. For long gloves, the sleeve hole is first tightened and then the gloves are adjusted over the sleeve.
4. Just before entering a building for an internal intervention, a person in charge checks whether the intervention clothing is properly worn, closed and adapted around gloves, neck and face mask, etc. and the pressure is recorded in the compressed air cylinder. In particular, make sure that the garments cover the entire body and check all fastenings.
5. Please make sure that the touch and close fastener is always closed and completely covered.
6. Wash the clothing after each major intervention or after any incident involving contact with potentially harmful substances such as chemical or flammable products, blood-borne pathogens, heavy smoke/soot pollution,...

Inspection

As a wearer, visually inspect each layer **before** each reuse (after a wash or maintenance, or after a heavy intervention or exercise, or at least at an interval of 3 to 6 months depending on the intensity of use) to see if there is visible damage as a result of mechanical / thermal / chemical activity (holes, cracks, burns, abrasion, etc.). The integrity of the accessories must also be verified, such as the sewing thread, the zippers, the retro-reflective stripes, the touch and close fastener,... . Any modification to the outer fabric (damage, colour, suppleness, etc.) requires a thorough examination.

Both the jacket and the trousers have inspection openings which allows to check the integrity of each layer. If you are unsure as to whether the clothing is still suitable for intervention, contact your garment responsible who will decide whether to repair or replace it.

During normal use of the clothing, these inspection openings must be closed!

If the clothing has not been included in a systematic, controlled internal or external cleaning, maintenance or repair procedure, a (clothing) responsible of the fire station trained by us (manufacturer) must check the intervention clothing at least once a year.

If your clothing need to be repaired, inform the person in charge so that he can make the necessary arrangements.

Decommissioning

The garment must be taken out of service:

- after each clear degradation, excessive wear, after carbonisation of one or more layers or if you notice other degradations
- in the event of an irreparable critical or serious defect (e.g. defective zipper, irreparable cracks in the structure of the material, etc.)

The decommissioning decision and corresponding action must be taken by a qualified person in charge.

Cleaning and maintenance

The assembly of the firefighter's intervention clothing consists of inherently flame-retardant fabrics. However, this property can be adversely affected by certain treatments. Flammable dirt, such as oil, grease, dust and chemicals, can reduce the flame retardant properties as well as the anti-static properties.

Regular maintenance of the clothing is necessary in order to guarantee the safety of the wearer and to increase the lifetime of the clothing. Wash the clothing after every important intervention, such as fighting a fire, or after every incident where there has been contact with potentially harmful substances such as chemical products.

In maintenance, *intervention clothing is treated separately* from other types of clothing.

Important points of attention :

1. **It is important that the type of soiling and/or type of intervention is communicated to the laundries so that they can take this into account during the washing process.** Cross-contamination must be avoided in all stages before, during and after laundry of the garments. Dirty clothing must not be located in the same room as clean clothing (reason: soiling may be volatile, semi-volatile or non-volatile). During washing, the highly soiled clothing must be separated from less soiled clothing (eg polo, station wear, balaclava, etc.; → underclothing cannot be washed with fire intervention clothing)
2. During the maintenance of the intervention clothing, the wash and drying temperature, the use of soft water during the pre- and main wash, and not exceeding the acidity limits (of minus pH 4 and max pH 9) are very important for maximum colour retention. Hard water has an inverse effect on the removal of dirt. The mineral salts present in hard water can trap insoluble particles on the fabric surface, which reduces the garment's flame retardant properties.

Before washing, all clothing closures (zipper and touch and close fastener) must be closed or covered. These have an abrasive effect on tissue surfaces. All constrictions must be returned to their original condition in order to avoid abrasion points. **All pockets must be emptied and removable accessories removed.**

Fabric softeners have a negative effect on the quality of the clothing (fabrics and accessories) and should therefore not be used.

A correct machine loading ensures an optimal cleaning and a minimal mechanical impact on the clothing. The *recommended load is 50 to 60%*. With a higher load, the dirt cannot be removed sufficiently and there is a risk of permanent wrinkling. A lower load implies a higher mechanical action, resulting in a higher surface wear.

Washing in an open-end washing machine is recommended. Washing in a continuous batch washer (CBW) is not allowed.

Rinsing the intervention clothing after washing is very important in order to remove all residues of detergents and products. This must be done with sufficient water.

The surface of the outer fabric is treated with a water and oil repellent product. However, the effects of this product diminish during wear and maintenance. For organisational/logistical reasons, we recommend re-treatment at each wash. This ensures that your garment is optimally water and oil repellent after each wash. This treatment must be followed by a heat treatment (for correct temperature = see instructions applied fluorocarbon product) for the activation of the fluorocarbon finish.

A simple test can determine if the re-treatment has been carried out correctly: a drop of cold water on the outer fabric surface. If the tissue absorbs the droplets directly, this fluorocarbon insertion is not sufficient. If the tissue is well water-repellent, the droplets will peel off from the surface of the outer fabric.

If the intervention clothing has come into contact with asbestos, the clothing must be rinsed with a spray jet when leaving the deployment before taking off the respiratory protection equipment. The clothing should be brushed with tap water, paying special attention to the seams, pockets, collar, closure, gloves and boots.

The outer clothing is taken off with assistance, while the respiratory protection equipment remains connected. Subsequently, a lukewarm shower is taken. Only then will the compressed air unit be removed and further undressed. Spare clothing must be available.

Always avoid contaminated clothing when entering the fire brigade or the barracks without appropriate packaging! The contaminated clothing must be sealed in an airtight package with the statement 'contains asbestos fibres'. Follow the local specific safety regulations. The clothing should then be washed separately (!) under controlled conditions, without cross-contamination, with the necessary safety measures for the manipulation and the environment.

Note: In case of serious contamination, the HazMat (Hazardous Materials) procedure alongside the decontamination procedure may be considered.



If you see this logo on your intervention clothing, it contains an integrated RFID tag

In this way, the garments can be traced with RFID tags and logistic issues can be monitored, such as the logistic chain of the garment from production at the manufacturer to the end of its lifespan and, for example, the registration of maintenance

We work with a UHF RFID as standard, but this can also be adapted to another type in (timely) consultation.

Care instructions



Maximum permitted temperature: 60 °C

In case of stubborn dirt it is advisable to subject the clothing to a supplementary washing cycle.

After a fire intervention, the clothing may be contaminated.

For such clothing the following is recommended :

- A prewash ;
- A sufficiently long main wash (minimum 30 minutes) and
- Multiple rinses (minimum 3).



The use of chlorine bleaching agents is not permitted.

These products will not only affect the colour, but will also weaken the fabrics.



The intervention clothing may be dried in a tumble drier or in a drying cabinet.

- **Drying in a tumble dryer:**

The intervention clothing should preferably be dried in a tumble-dryer with residual moisture content measurement. It is best to turn the clothing inside out. Upon reaching a residual moisture content of 15-20%, the garment is turned back (outer fabric on the outside) to ensure optimal drying and good activation of the fluorocarbon.

Activation of the waterrepellent product: the waterrepellent treatment provided in the washing process must be followed by drying at 80 °C in order to activate polymerisation. This temperature may not be exceeded. It is highly recommended to perform detergent tests and any program modifications if necessary.

- **Drying in a drying cabinet (or hanging drying):**

The use of a drying cabinet (hanging drying) is permitted. This way of drying reduces the mechanical action on the clothing.

Activation of the water-repellent product: at the end of the drying cycle, provide for a reactivation phase of 30 minutes, at a maximum temperature of 75 °C. This ensures that the applied fluorocarbon treatment is fully activated.

- **Drying in a drying tunnel is not allowed (too high temperature!).**



The intervention clothing can be ironed at a maximum temperature of 110 °C. Any contact with the retro-reflective and fluorescent stripes and other accessories must be avoided.



Dry cleaning of the intervention clothing is not recommended. Contact us, for specific advice, if you want to do so. For certain models, this is simply not allowed.

With regards to occupational safety and hygiene procedures, please refer to the specific instructions in your fire brigade zone or station.

Professional maintenance instructions

1. Routine washing

Step	Time (min)	Temperature (°C)	Level	Detergent	pH
Loading	60% (+/- 5%)				
Prewash	10	60	1:5	Maxim. Product 1(*) 10 ml/kg Product 2 (*) 4 ml/kg	7-9 max
Drain	1				
Main wash	15	60	1:5	Maxim. Product 1*: 15 ml/kg Product 2*: 2 ml/kg	7-9 max
Drain	1				
1st Rinse	3	Cold	1:7		
Drain	1				
2nd Rinse	3	Cold	1:7		
Drain	1				
3rd Rinse	3	Cold	1:7		
Drain	1				
Neutralize	3	40		Product 3*: 1-2 ml/kg	6-7
Drain	1				
Application (water repellency)	3	40	1:4	Product 3*: 1-2 ml/kg	4-5
Application (water repellency)	15	40	1:4	Product 4*: 20 ml/kg	4-5
Centrifuge + interval	2				
Swing (550 rpm)	5				

2. High Care (heavily soiled) washing

Step	Time (min)	Temperature (°C)	Level	Detergent	pH
Loading	50% (+/- 5%)				
Prewash	15	60	1:6	Product 1 10 ml/kg Product 2 6 ml/kg	7-9 max
Drain	1				
Main wash	30	60	1:5	Product 1: 20 ml/kg Product 2: 4 ml/kg	7-9 max
Drain	1				
1st Rinse	3	Cold	1:7		
Drain	1				
2nd Rinse	3	Cold	1:7		
Drain	1				
3rd Rinse	3	Cold	1:7		
Drain	1				
Neutralize	3	40		Product 3: 1-2 ml/kg	6-7
Drain	1				
Application (water repellency)	3	40	1:4	Product 3: 1-2 ml/kg	4-5
Application (water repellency)	15	40	1:4	Product 4: 20 ml/kg	4-5
Centrifuge + interval	2				
Swing (550 rpm)	5				

Washing is done with soft water: °F = 0-7 ; °D = 0-4.

The following products have been tested with the above process and produce a good end result. For High Care we have only tested with Ecolab products.

	Product 1	Product 2	Product 3	Product 4 = FLC finish
Ecolab	Turbo Usona	Triplex Energy Plus	Acid	Saprit Protect Plus

(*) If you work with other detergents, the concentrations will differ and your detergent supplier or washing machine supplier can advise you on equivalent products and procedures. For "routine", this includes:

	Product 1	Product 2	Product 4
Kreussler	Derval Rent	Derval Protec	Hydrob FC
Christeyns	Selox Micran	Mulan Natural Free	Osmafin Aquablok Plus

(**) Depending on the type of machine and drum capacity, this value may need to be adjusted. Informative: some machine manufacturers express spin speed in "G-factor".

Note:

Study of the microbiological destruction factor of the "High Care" washing process with a "DES controller of the microbiological elimination factor of a washing process (SN 175368) - test organism: enterococcus faecium" confirms the elimination factor of 10^6 .

Guarantee that the garment is hygienically clean - in particular that the "High Care" washing process has sufficient germicidal capacity - that a germicidal reduction of 10^6 has been achieved. Attention = only valid for the washing procedure mentioned (45 minutes at 60 °C)

Results Des-infection Controller	KT4-6
Testorganism: Enterococcus faecium	Serial number : 175368
Data process Date measurement: 26-07-2018 Machine: WE 10 Primus Program: 59°	

Results per starting value (kve/cm²)			
10³	10⁴	10⁵	10⁶
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Killing factor :	10⁶		
	Remark: *Firefighter turnout gear High Care.		

For more information on maintenance instructions, safe methods of repair and destruction, please contact your Sioen distributor.

EN 1149-5:2018

Electrostatic clothing to be used as part of a fully earthed system, in order to prevent accidental discharges constituting a fire hazard in an explosive atmosphere (ATEX environment; Zones 1, 2, 20, 21 and 22 where the minimum ignition energy is not less than 0.016 mJ).



EN 1149-5

Protective clothing with reference AS

This P.P.E. is part of a fully anti-static and earthed system. Anti-static protective clothing can consist of a one-piece garment (coveralls) or several garments (jacket, trousers, body warmer, etc.) and is required at all times to cover all non-compliant (non-static dissipative) materials (e.g. underclothing) fully (even while moving, bending over, etc.) and overlap sufficiently (e.g. jacket/trouser suit)! For instance, an [EN 1149-5](#)-compliant thermal or high-visibility waistcoat, etc. must be worn over other anti-static garments. Only the outer layer of an individual multilayer garment must have anti-static properties.

Wearers of this P.P.E. require to be earthed at all times in order to dissipate electrostatic charges. Contact must therefore be provided between the wearer's conductive fabric and conductive footwear ([EN 20344](#)). The electrical resistance between the wearer and earth must be less than 10⁸ Ω (beware of insulated or heavily soiled floors). Anti-static properties cannot be adequately guaranteed when working on electrical systems where electrically insulating footwear is required.

This garment must be put on before entering the ATEX environment. It must be fully fastened and existing constricting systems (e.g. at the ends of sleeves) require to be fitted in order to provide adequate contact with the skin or conductive underwear. The hook and loop parts of touch and close fastenings must overlap completely and be pressed together firmly. Clothing must not be unfasten or removed in the ATEX environment and removable parts (e.g. name badges, shoulder pads, etc.) must not be removed from the garment.

All conductive metal parts require to be fully covered in use by anti-static material (e.g. a belt with a metal buckle must not be worn with trousers provided with loops if it is not covered by a jacket).

Anti-static clothing must not be used in an oxygen-enriched atmosphere or in a zone 0 without prior approval from the safety engineer in charge! Electrostatic properties may

decline during use and due to cleaning, soiling, etc. Changes to the style are not permitted.

EN ISO 11612:2015

Protective clothing with limited flame spread and protection against industrial heat



EN ISO 11612
a b c d e f

Protective clothing with reference F_{Ax}B_xC_xD_xE_xF_x

Limited flame spread: A1: Surface ignition and/or A2: bottom-edge ignition.

Limited flame spread, afterflame time and afterglow time ≤ 2 s, no hole formation, no flaming or molten debris.

This standard defines the following heat transmission performance aspects (the limits are based on avoiding second-degree burns).

Convective heat (flame) HTI24 Index		
	Min.	Max.
B1	4 s	< 10 s
B2	10 s	< 20 s
B3	20 s	

Radiant heat 20 kW/m ² RHTI24 Index		
	Min.	Max.
C1	7 s	< 20 s
C2	20 s	< 50 s
C3	50 s	< 95 s
C4	95 s	

Molten aluminium splash		
	Min.	Max.
D1	100 g	< 200 g
D2	200 g	< 350 g
D3	350 g	

Molten iron splash		
	Min.	Max.
E1	60 g	< 120 g
E2	120 g	< 200 g
E3	200 g	

Contact heat (250 °C)		
	Min.	Max.
F1	5 s	< 10 s
F2	10 s	< 15 s
F3	>15 s	

This clothing is not intended for use as firefighting clothing! This is not aluminised heat-reflective clothing!

In the event of fire or exposure to flames, distance yourself as quickly as possible from the flame / heat source. Protection is no longer guaranteed after serious damage. Dirt residues of flammable substances or certain chemicals on the clothing (e.g. oil, etc.) have an adverse effect on limited flame spread. In case of contamination with chemical or flammable liquids the user must leave the working environment immediately, take off the garment carefully such that the liquids do not come into contact with the skin, and have it laundered or taken out of use.

In case of contamination with molten metal the users must also leave the working environment and take off the garment since the clothing, if worn immediately next to the skin, cannot eliminate all risks of sustaining burns! Pocket flaps, etc. must be closed in order to eliminate any possibility of accumulation of molten metal in folds, pockets, etc.

Only those parts of the body covered by this P.P.E. are protected. In the clothing make-up, at least the entire body requires to be protected by EN ISO 11612 P.P.E.

Where protection is provided by an outer two-piece suit, overlap of at least 20 cm shall be maintained on a wearer when attempting to touch his/her toes with the fingertips while standing.

EN 15614:2007

Protective clothing for Wildland firefighting



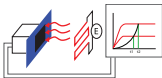
EN 15614

This P.P.E. is referenced with code WLD

This P.P.E. is designed for use for extended periods during wildland firefighting and associated activities. Wildland firefighting involves work primarily in summer temperatures, for many hours during which the firefighter may develop high levels of metabolic heat.

Accordingly a risk assessment should be undertaken to determine if the clothing covered by this European Standard is suitable for its intended use and the expected exposure. This European Standard does not cover clothing for use in risk situations where clothing complying with EN 469 is more suitable, or where a high level of infrared radiation is expected (EN 1486), nor does this European Standard cover clothing to protect against chemical, biological or radiation hazards.

The risk assessment should include what additional personal protective equipment is necessary for head, hands and feet. In some situations respiratory protection may be required.



This P.P.E. passed the following Radiation Heat (20 kW/m²) test:

- $RHT_{12} - RHT_{12} = \text{reaction time} \geq 4 \text{ seconds}$
- $RHT_{24} = \text{time for second degree burn: } \geq 11 \text{ seconds}$
- $RHT_{12} = \text{time for pain sensation (1° burn)}$
- Mean Heat Transmission Factor (TF) $\leq 70\%$

EN ISO 15384:2020 (+A1:2021)

Protective clothing for Wildland firefighting



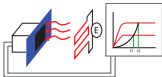
EN ISO 15384

This P.P.E. is referenced with code WLD

This P.P.E. is designed for use for extended periods during wildland firefighting and associated activities. Wildland firefighting involves work primarily in summer temperatures, for many hours during which the firefighter may develop high levels of metabolic heat.

Accordingly a risk assessment should be undertaken to determine if the clothing covered by this European Standard is suitable for its intended use and the expected exposure. This European Standard does not cover clothing for use in risk situations where clothing complying with EN 469 is more suitable, or where a high level of infrared radiation is expected (EN 1486), nor does this European Standard cover clothing to protect against chemical, biological or radiation hazards.

The risk assessment should include what additional personal protective equipment is necessary for head, hands and feet. In some situations respiratory protection may be required.



This P.P.E. passed the following Radiation Heat (20 kW/m^2) test:

- $\text{RHTI}_{24} - \text{RHTI}_{12}$ = reaction time ≥ 4 seconds
- RHTI_{24} = time for second degree burn: ≥ 11 seconds
- RHTI_{12} = time for pain sensation (1° burn)
- Mean Heat Transmission Factor (TF) $\leq 70\%$

EN 16689:2017

Protective clothing for Firefighters for Technical Rescue



This P.P.E. is referenced with code STR

Technical rescues involves work associated with the environments, and conditions associated with operation scenarios such as but not limited to those found during road traffic collisions and when working in and around collapsed structures of often for extended periods of time after natural disasters, ... where protection against mechanical risks, limited heat and flame and conspicuity is needed. Unless combined with other specialised P.P.E. and tested accordingly, this clothing is not applicable to protect against risks encountered in (structural) firefighting, wildland fires, or rescue from fire, dealing with hazardous chemicals, working with chainsaws and water and rope rescue.

This P.P.E. passed the 20 kW/m^2 Radiation Heat (20 kW/m^2) test: RHTI_{24} = time for second degree burn: ≥ 7 seconds; and a 100°C contact heat test with a threshold time of minimum 5 seconds.

If the surface of the outer fabric is treated with a water and oil repellent product (which is optional), the effects of this product diminish during wear and maintenance. For organizational/logistical reasons, we recommend re-impregnation after each wash.

Protection against Infectious (blood borne) pathogens, by the use of a extra barrier layer (membrane) is an optional requirement in this EN standard. Check for the presence of a membrane in your specific garment. When the membrane is damaged, this protection if no longer present.

General note: Clothing must be worn fully closed. In case of fire or exposure to flame, remove from flame/heat source as soon as possible. Protection is no longer guaranteed

after serious damage. Dirt residue from flammable materials or certain chemicals on the clothing (e.g. oil,...) has a negative influence on the limited flame spread. In the event of contamination with chemical or flammable liquids, the user should immediately leave the work area and remove the garment carefully, so that the liquids do not come into contact with the skin, wash or take them out of use.

EN 16689:2017: Protective clothing for Firefighters for Technical Rescue and/or EN 15614:2007 / EN ISO 15384:2020 (+A1:2021) Protective clothing for Wildland firefighting can be combined in the same garment; and/or even with Structural Firefighting clothing EN 469 class Xf1/Xr1 (only valid when indicated on the label, please check the label).

The above clothing could also be combined with an additional garment to reach Structural Firefighting clothing EN 469 class Xf2/Xr2 (only valid if specific combination is indicated on the label, please check the label).

The above mentioned standards hold specifications on conspicuity (visibility). Below table gives an overview of the visibility requirements in different standards which could be relevant to this P.P.E. (check the label):

	Surface retro-reflective (nighttime visibility)	Surface fluorescent (daytime visibility)	Or optional combined performance material
EN 469 Annex B (*)	≥ 0.13 m ²	≥ 0.20 m ²	≥ 0.20 m ²
Wildland Firefighting	≥ 0.13 m ²	≥ 0.20 m ²	≥ 0.20 m ²
Technical rescue	≥ 0.13 m ²	≥ 0.50 m ²	-
EN ISO 20471 class 1	≥ 0.10 m ²	≥ 0.14 m ²	≥ 0.20 m ²
EN ISO 20471 class 2	≥ 0.13 m ²	≥ 0.50 m ²	-
EN ISO 20471 class 3	≥ 0.20 m ²	≥ 0.80 m ²	-

* Optional

SIOEN

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