Ref : HVFRACH-18

Instructions for the user :



Antistatic protective high visibility clothing (one or two pieces) for industrial workers exposed to heat and flame (including welders and thermal hazards of an electric arc) that offers limited protection against chemicals, according to the European standards :

- EN ISO 13688:2013
- EN ISO 20471:2013
- EN 1149-5:2018
- EN ISO 11612:2015
- EN ISO 11611:2015
- EN 61482-2 :2020
- EN 13034 :2005



EN ISO 11612:2015 A1 A2 B1 C1 D0 E1 F2



EN 13034 :2005 + A1:2009 type 6



EN ISO 11611:2015 Class 1 A1 A2



EN ISO 20471:2013 + A1:2016



EN 1149-5:2018



EN 61482-2:2020 APC 1 / ELIM = 8,3 cal/cm²

This range of garments is designed in line with the applicable European standards EN ISO 13688:2013, EN ISO 20471:2013+A1:2016, EN 1149-5:2018, EN ISO 11612:2015, EN ISO 11611:2015, EN 61482-2:2020 and EN 13034:2005+A1:2009.

Type testing has shown that the clothing complies with the fundamental requirements as described in European Regulation (EU) 2016/425 on personal protective equipment.

For declaration of conformity : see <u>www.roots-original.com/certificates</u>

The type examination of this protective equipment was carried out by : SGS Fimko, Topeliuksenkatu 41 b, FI-00250 Helsinki, Finland (identification number : N.B. 0598).

The quality control of this protective equipment is carried out by : Centexbel, Technologiepark 70, B-9052 Zwijnaarde (notified body with identification number : N.B. 0493).

Please make sure to read these instructions carefully before the first use of the garments and keep them for future reference.

Application of the garments

These garments comply with standard **EN ISO 11612** (protective clothing to protect against heat and flame, excluding welders and firefighters). This means that the wearer is protected against short contacts with a flame as well as (to a certain extend) against convective, radiant and contact heat. Classification system :

A1 : outer material tested for flame spread according to EN15025 procedure A (flame on the surface)

A2 : outer material tested for flame spread according to EN15025 procedure B (flame on the edge)

Bn : convective heat : 3 levels where 1 is the lowest

Cn : radiant heat : 4 levels where 1 is the lowest

Dn : spatter of molten aluminium : 3 levels where 1 is the lowest

En : spatter of molten iron : 3 levels where 1 is the lowest

Fn : contact heat : 3 levels where 1 is the lowest

remark : when n equals 0, this means that the garments are not offering protection for this type of hazard.

These garments comply with the requirements of **EN ISO 11611** (protective clothing for use in welding) with class n as protection level and will protect you during welding (or similar) activities. Classification system :

Class 1 : suitable for hand welding where smaller amounts of spatter occurs - see table below for examples

Class 2 : suitable for hand welding where bigger amounts of spatter occurs - see table below for examples A1 : outer material tested for flame spread according to EN15025 procedure A (flame on the surface) A2 : outer material tested for flame spread according to EN15025 procedure B (flame on the edge)

Type of welders'	Selection criteria relating to the process	Selection criteria relating to the environmental conditions	
clothing			
Class 1	Manual welding techniques with light formation of spatters and drops, e.g. : - gas welding - TIG welding - MIG welding (with low current) - micro plasma welding - brazing - spot welding - MMA welding (with rutile- covered electrode)	 Operation of machines, e.g. : oxygen cutting machines plasma cutting machines resistance welding machines machines for thermal spraying bench welding 	
Class 2	 Manual welding techniques with heavy formation of spatters and drops, e.g.: MMA welding (with basic or cellulose-covered electrode) MAG welding (with CO₂ or mixed gases) MIG welding (with high current) self-shielded flux cored arc welding plasma cutting gouging 	 Operation of machines, e.g. : in confined spaces at overhead welding/cutting or in comparable constrained positions 	

 oxygen cutting 	
 thermal spraying 	

These garments also fulfil the requirements of standard **EN 61482-2** (protective clothing against the thermal hazards of an electric arc).

APC (arc protection class) 1 means that the material/clothing has been tested with an exposure at 4 kA during 0,5 s and APC 2 with an exposure at 7 kA during 0,15 s.

ELIM = xx cal/cm² are the result of the open arc test. ELIM stands for incident limit below which there are no test results available on heat transmission leading to second-degree skin burn or break open of the material.

Both material and clothing have been tested.

All garments from this range comply with the standard **EN 1149-5** (antistatic clothing - tested according EN 1149-3 method). This means that the garments are designed to discharge electrostatic charges in order to prevent the generation of sparks that could cause fire and/or explosions. However, these requirements are not sufficient in oxygen enriched flammable atmospheres. Neither are the garments designed to protect against mains voltages.

This clothing also provides limited protection against chemicals (EN 13034). The classification is type 6. This means that the garments were subject of a spray test on the full suit and thus are designed to protect the wearer against a mist of chemicals. The protection is limited to small amounts of splashes of chemicals. The garments are certainly not gas or liquid tight. In the table you will find the test results for the fabrics used.

	Maximum performance level	Obtained result	
Abrasion resistance	class 6	class 6	
Tear resistance	class 6	class 3	
Tensile strength	class 6	class 5	
Puncture resistance	class 6	class 3	
Liquid repulsion	class 3	H2SO4 30% : class 3	
		NaOH 10% : class 3	
Resistance to penetration by	class 3 H2SO4 30% : class 3		
liquids		NaOH 10% : class 3	
Seam strength	class 6	class 5	

These garments are in compliance with the requirements of **EN ISO 20471** (high visibility protective clothing). The combination of high quality fluorescent fabric with retro-reflective tapes signals your presence visually as well during the day as at night in the beam of a light source (e.g. the headlights of a car).

X : class related to the surface of both fluorescent and retro-reflective material (*)

	class 3 :	fluorescent surface :	min. 0,80 m²
(*)		retro-reflective surface :	min. 0,20 m ²
required surface :	class 2 :	fluorescent surface :	min. 0,50 m²
		retro-reflective surface :	min. 0,13 m²
	class 1 :	fluorescent surface :	min. 0,14 m²
		retro-reflective surface :	min. 0,10 m²

Correct use of the garments

Even while wearing appropriate protective clothing, you need to be aware of the fact that your safety can not be guaranteed in all circumstances and that you remain responsible for your own safety. Please do take the following into account :

- These garments are designed to protect the whole of your body. Therefore, it is necessary that you wear a full body suit (coverall or 2-piece suit). In the case of a 2-piece suit, the parts of the suit can be sold or delivered separately. In the design of 2-piece suits (jacket and trousers) an adequate overlap is ensured and this during all foreseeable movements. Take this minimum overlap into account while choosing your correct size.
- In order to be protected during your activities, it is crucial that you keep the garments closed at all times. This also means that you need to use the adjustments provided at your wrists, ankles and/or waist. These adjustments ensure a good contact between your body and the conductive material, which is essential to obtain discharge of electrostatic charges. This will also prevent spatter from entering the clothing, which could cause burn injuries.
- If the garment has a hood, make sure the hood is either worn correctly (with the adjustments provided) or tucked away in the collar if that possibility is provided during your activities.
- Every pocket or pass-through must be closed at all times to prevent spatter to enter in the clothing and thus forming a risk for your safety. If your trousers or bib & brace has pockets without flap, make sure the pocket openings are covered by a jacket (or other suitable clothing) while working.
- To prevent spatter to get trapped in the clothing, all folds have been avoided in the design of the garments. Take this also into account while wearing the garments. If for instance your sleeves or trouser legs are too long, do not fold them over to the outside as this would form a turn-up. Do contact the responsible person in your company in this case.
- For a complete protection you will need to wear additional personal protective equipment for your hands, feet and face.
- Garments soiled (e.g. with flammable products) will not have the same protective characteristics. Therefore, regular and careful cleaning and maintenance will ensure the efficiency of the clothing. Do not store the garments in solvents, washing solutions, disinfecting or stain removing products. Do not store the clothing when soiled-have them cleaned before storage.
- For operational reasons not all welding voltage carrying parts of arc welding installations can be protected against direct contact. Do keep that in mind while arc welding.
- These garments are designed to provide protection against short term, accidental contact with live electric conductors at voltages up to approximately 100 V d.c. Additional electrical insulation layers will be required where there is an increased risk of electric shock.
- The insulation from electric current will decrease significantly if the clothing is wet, dirty or impregnated with sweat.
- If you need to work in oxygen enriched environments (certainly to be verified in confined spaces), you will need to consult the safety responsible in your company since these garments are not suitable for the risk related to this type of environment.
- If your clothes should come into contact with molten metal, you must leave the working place and remove the clothes. In this case risks on burns cannot be excluded if the clothes are worn directly on the skin.
- This clothing only offers limited protection against chemicals. If your clothes should accidentally come into contact with chemical spatter, you must remove them immediately, taking care that the chemical does not touch your skin. Give the clothing to the person in charge of its maintenance separately so that no other clothing comes into contact with the chemical. The person in charge of its maintenance will take the necessary measures to adequately clean the clothing or, if necessary, replace it.
- At the design stage the manufacturer ensured that all metallic parts are covered during the normal use this to prevent the generation of sparks. Do make sure that while wearing this clothing all metallic parts of accessories (for instance the belt may not have a metallic buckle) are covered at all times. Also make sure that these protective garments completely cover your underlying clothing at all times (this means also when bent over for instance).
- To ensure discharge of electrostatic charges, the garments need to be earthed one way or the other. Contact between the conductive garments and conductive footwear will certainly enhance this discharge. In any case, a correct earthing (maximum resistance 10⁸ Ohm) is essential.
- While wearing these garments in an ATEX environment, do not attach or hitch accessories or equipment to the outside of the garments that do not meet the requirements for materials to be used in explosion hazardous conditions (ɛx materials and equipment as foreseen in the ATEX requirements). Make sure to use in this type of environments only explosion safe equipment for instance your mobile phone is best kept outside this zone or at least switched off. In any case, do not attach any materials that contain metal to the outside of the garments !

- The electrostatic properties of the garments can be influenced by use, care, maintenance and possible contamination. Make sure you evaluate or have evaluated the properties on a regular basis.
- Your electrostatic dissipative garment is intended to be worn in Zones 1, 2, 20, 21 and 22 (see EN 60079-10-1 [7] and EN 60079-10-2 [8]) in which the minimum ignition energy of any explosive atmosphere is not less than 0,016 mJ
- Under no circumstances you should take this type of clothing off in an explosive or inflammable atmosphere or while handling inflammable or explosive substances.
- These garments are not designed to protect you against mains voltage, in that case, you need to use other appropriate protective equipment.
- Clothing worn under these garments (e.g. t-shirt, underwear, ...) shall not be made of materials that could melt under arc exposures this will be the case for garments made of e.g. polyamide, polyester or acrylic. Consult with the safety responsible in your company in case of doubt.
- Wearing other garments or equipment (such as breathing apparatus or a backpack) over the highvisibility garments may affect the effectiveness of these garments.
- For trousers or bib & brace pants retro-reflective tapes and/or the fluorescent surface may not be covered by a jacket (or other pieces of clothing) unless these are part of the complete visibility protection.
- Do take into consideration that :
 - vehicles need enough time to come to a complete stand still (even if the driver is made aware of the obstacle on time).
 - visual signalisation of your presence might be obstructed or diminished by different obstacles such as :
 - o vehicles;
 - o tools of all kinds;
 - natural elements such as trees or bushes;
 - external lighting in the environment (streetlights for example).
 - weather conditions will have an influence on your visibility : rain or fog will shorten the distance that you are visible wearing these garments.
- If your garment contains fluo-red colour, it is possible that in the course of the lifetime of the garment this colour shifts to a more orange-red. This has been tested vigorously and will not negatively affect your visibility.
- Damage such as holes or tears will most likely affect the protective properties of the clothing. Make sure to check your garments regularly (preferably each time before you put your garments on) for damage or ageing. If required have them repaired or replaced. Rough mechanical or chemical action (e.g. during washing) will diminish the functionality and lifetime of the garments.
- Possible repairs or adjustments (e.g. attaching badges/logos) must be carried out by trained personnel and using only the original materials as specified by the manufacturer at the time of certification and taking into account the model requirements from the standards used. Preferably contact your supplier for more information about the possibilities.
- If kneepads are incorporated in the garments, these are only designed to enhance your comfort and/or the resistance of the garment not to protect you against possible specific risks for your knees.
- There are no known cases of allergies to the materials used for the production of this clothing. The materials used are - according to the information currently available - not carcinogenic, mutagenic or toxic to human reproduction.
- After use, the garments can be recycled using the appropriate specialised means.
- Applying specific finishes such as for instance waxes or fluorcarbon might alter the protective properties of the clothing.
- If you experience sunburn-like symptoms, UVB radiation is penetrating the garments. In this case, the garments should be repaired (if practicable) or replaced. Consider the use of additional, more resistant, protective layers to protect you against this UVB radiation.

The supplier of the garments is not responsible for damage, in any form, caused by inappropriate use or abuse of the garment.

Sizing (conform EN ISO 13688:2013)



A = total length (cm)
B = chest girth (cm) - is indicated for coveralls, jackets, coats and vests
C = waist (cm) - is indicated for coveralls and/or trousers

All sizes indicated on this mannequin are measured on the wearer - these are not the same as the measurements of the garment.

Reference

The reference of the technical file submitted for certification to the notified body is HVFRACH-Xn-18 where, HV refers to high visibility clothing, FR refers to heat and flame protection, A refers to antistatic properties, CH refers to chemical protection, X refers to the type of garment, n refers to the class of EN ISO 20471, and 18 is a rotation number.

Type of garment : x = J : jacket x = T : trousers x = C : coverall

Next to this reference you can also find a specific model reference on the label of the garment.

Care and maintenance

The washing frequency of clothing which has been worn depends on the degree of dirtiness, which varies according to the work circumstances.

Some general guidelines :

- High visibility clothing always needs to be washed separately.
- Never store soiled garments.
- In order to prevent damage during washing, it is advisable to close zips and Velcro closures.
- Washing with limited mechanical action is preferred in order to avoid damaging of the reflective tapes. For the same reason, we advise you to wash the garments inside out.
- After washing the clothing must be rinsed thoroughly in order to remove all traces of detergents. In no case must fabric softener be used.
- Stains can best be removed as soon as possible using a cloth. Persistent stains can be treated locally with perchloroethylene if necessary.
- Specific instructions for industrial maintenance can be obtained from the manufacturer.

Tests at the laboratory and without any other ageing factor, have demonstrated that the requirements for the flame spread of standards (EN ISO 11611 and EN ISO 11612) are met after 50 wash cycles at 60°C.

Washing tests at a laboratory proved that the fluorescent and retro-reflective material fulfils the requirements of the standard for high visibility clothing (EN ISO 20471) after the number of wash cycles indicated on the label of your garment according to the specified washing instructions.

The stated maximum number of cleaning cycles is not the only factor related to the lifetime of the garment. The lifetime will also depend on usage, way of storage, etc.

In order to maintain the chemical repellent characteristics, it is necessary to treat the garments at least every 5 cleaning cycles with a repelling finish. For the exact procedures please contact the manufacturer of the garment.



Maximum wash temperature is 60°C. (remark : washing at lower temperatures will have a positive effect on the lifetime of the garments. The lifetime is also influenced by the type and dosage of detergents.)



Do not bleach.

Tumble drying possible at lower temperature.



Iron at maximum sole plate temperature of 150°C.



Professional dry cleaning in solutions like tetrachlorethene and hydrocarbons possible.



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