

Fire Fighting Suit "GRISU"



General product informations for „GRISU“ family

GRISU, GRISU - FWP, - Universal, - HuPF, - Bayern 2000

GRISU - under this name of the comic's little dragon which liked to be a fireman - ALWIT manufactures and distributes protective garments for firefighters, independing of outershell material, colour, and location, size or kind of pockets, retroreflective or/ and fluorescent elements.

GRISU may be manufactured with detachable thermal lining or with fixed sewn-in lining.

But all these types of **GRISU** are designed according the basic and additional requirements of EN 469.

In case of detachable lining each layer is marked with a label, warning that the requirements of EN 469 are only met, if all layers were used together.

In this case also a separable connection between the layers inside at the bottom seam of jacket prevents the chimney effect that means entry of flames.

Developing **GRISU** the Basic Health and Safety Requirements of Annex II of the Directive 89/686 have been taken into consideration.

That concerns especially the choice of materials as well as the design of the garments.

GRISU is intended to protect firefighters' body excluding head, hands, and feet, from the effects of heat and flame at firefighting.

That means that additional personal protective equipment is needed to protect the head, hands, and feet, and in many firefighting situations breathing apparatus must be worn.



Even the built-in moisture barriere, that allows the passage of water vapour, may offer a certain protection against chemicals, **GRISU** shall not be used as chemical protective suit.

GRISU does not cover special clothing for use in high risk situations, e.g. fire entry suits, or clothing for use in long term firefighting operations in high ambient temperatures, e.g. forest firefighting.

It does not cover protection against other hazards, e.g. chemical, biological, radiation and electrical hazards.

These hazards may be dealt with other ALWIT protective garments according to other standards.

GRISU is made of several material layers (material assembly) which moreover are to be washed or cleaned different because its various accessoires.

In order to get a simple and standardized way of care the material developements have been harmonized with the manufacturers of raw materials so that the protective clothing may be washed at **one** temperature only or be dry cleaned, too.

The corresponding **care labels** can be found in the garments and on the packing.

In order to avoid storage of foreign substances, e.g. cotton fibres, protective garments should be **washed separately** from other garments. So the inherently flame retardant properties of the garment will be saved, and contamination will not be carried off into the private sphere.

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Keep garments clean!

Storage of oil, fat or dust might reduce the protective properties. Regular and in time care would be expedient.

Before washing or cleaning all touch and close fasteners should be **covered by a pendant** in order to avoid a damage on the surface of the fabrics and retroreflective and/or fluorescent elements by the hook part of the fasteners, and to avoid the storage of fibres on the closure system, too. Clothing has not to be turned to the left (inner) side.

Alternative the protective garments may be washed or cleaned with fasteners closed.

But then the **cleaning effect** on the inside of the garment would be **limited** because its waterproof membrane.

Do **not stitch sharp objects** as needles or cramps through the garment because the waterproof membrane might be damaged.

If possible, **hardware** (e.g. hooks) and rear shields are to **remove** or to put into the pockets before washing, and pockets are to empty from other objects.

Avoid scrubbing as a form of cleaning. Extreme dirty areas might be slightly pre-brushed.

Pay also attention to the fact that abrasion by use or care may reduce the **warning effect** of retroreflective and/or fluorescent trims.

Please check therefore the remaining warning effect in time and send the garment back to us for touching up.



ALWIT sews protective garments by using threads of aramide fibres; therefore **repairing works** should be done with material supplied by us or by ourselves.

Printings on retro-reflective and/or fluorescent materials are subject of higher abrasion and should not be ashed or cleaned. We recommend therefore to select such printings on detachable shields.

Attention should be paid to the detailed washing and care instructions on the last page of this information which has been developed together by the manufacturers of most important components of the clothing as outershell and lining material (Dupont), breathable moisture barrier (Gore) and elements for high visibility (3M).

Washing procedure

Washing-/tumbling machine up to 20 kg; domestic washing might be generally possible in front loading machines up to 5 kg but it is not recommended because carrying the contamination into the private sphere, and because there is no possibility to re-impregnate the clothing as needed.

Filling ratio of washing machine

2/3 capacity of cylinder.

Washing programme

Coloured laundry at temperatures up to 60°C with relation of washing bath of 1:5.

Detergent

Washing protective clothing the bath should have a ph-value <10.



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Generally commercial detergents for coloured laundry should be taken. Fully washing detergents contain brightening agents, and therefore are not suitable.

Do not use bleaching agents or products that contain such decolorizer.

Do not use softeners.

Rinsing

After washing protective clothing shall be rinsed carefully in order to remove all residual alkaline and probably inflammable detergents.

2-3 rinsing cycles are recommended.

Note: Programmes for coloured laundry have usually 3 rinsing cycles which are sufficient to remove all residues from the clothing.

Re-impregnation

Dirt and oil repellent re-impregnation might be useful for better care, and has a positive influence on durability and efficiency of protection of the clothing.

Impregnation by fluorcarbonate during the last rinsing bath and consecutive heat treatment in the tumbler is recommended.

Impregnation by fluorcarbonate will lose its properties after about 10 washing cycles; in order to avoid uncontrolled loss of repellent properties and probably irresponsible administration and organisation **re-impregnation after each washing cycle** is recommended.

How to find out that the dirt and oil repellent impregnation has to be renewed?



Keep the outer shell material of clothing under water; whether the water is running off the impregnation is still working. Whether the water penetrates the outer shell material clothing should be re-impregnated as above mentioned.

Drying



After rinsing respectively re-impregnation cycle the bath has to be let off and the clothing shall be tumbled in intervals.

Hereafter the clothing shall be dried at 80°C (temperature at cylinder exit) in the tumbler until the residual humidity becomes -2%.

Note: Residual humidity of -2% means slightly overdrying. Under these conditions the film of fluorcarbonate gives an optimal effect.

Ironing

Protective clothing „GRISU“ may be ironed at a middle temperature setting (2 points) without vapour.

In order to protect retroreflective and/or fluorescent materials trims should be covered by a cloth.

Dry cleaning

Dry cleaning is recommended for extremely dirty clothing, e.g. contaminated by oil or fat but also by human or animal body fluids, to avoid carrying dangerous substances into the private sphere.

Dry cleaning shall be carried out according to the care label by usual 2-bath system using a booster and with reduced mechanics.

Commercial dry cleaning with perchlorethylene is recommended.

Touch and close fasteners are to be covered also while dry cleaned.

This kind of dry cleaning may only be carried out by specialists.

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Before protective clothing will be re-used it must be sure that the clothing is free of residual solvents.

Therefore the clothing should ventilate after dry cleaning at least for one day.

Take care that there are no cleaning labels clamped on the clothing because they might damage the water barrier.

Absolutely pay attention to the instructions of the care label which is sewn into the inner part of clothing.

Storage

To avoid dimming of colours protective clothing should not be stored under bright sunlight or other UV-radiating sources of light.

Heat or flame protective properties will not be influenced by UV-radiation.

Protective clothing shall be stored dry and dustfree.

During long-time use protective clothing shall be checked regularly by maximum own responsibility if all layers are intact and functional; otherwise the protective clothing shall be replaced.

Disposal

Used and separated protective clothing may be recycled if it has been cleaned before orderly.

If there are any further questions regarding use or maintenance of our protective clothing „GRISU“ please do not hesitate to contact confidently our team.

Complementary information about trousers



The information given before is basically applicable also for trousers and bib coveralls of the „GRISU“ – family.

They are valid without any restriction when trousers or bib coveralls are made of same material assembly as the jacket.

Trousers might be manufactured either with fixed, or detachable lining(s).

In order to improve comfort, trousers are often partially unlined or miss totally one or more layers. In this cases it must be considered which level of protection of EN 469:2005 can be achieved.

A risk assessment shall be base of decision if level 1 of EN 469:2005 could be sufficient for the trousers.

Before the revision of EN 469 such trousers of lower level of protection could only be approved and certificated according to EN 531 which is also used for the certification of fire fighters` station uniforms.

However it should be possible to meet the requirements of level 2 of EN 469:2005 with trousers which have partially level 1 areas if these areas are covered by a level 2 jacket of sufficient length.

Because jackets are always designed with a fixed or detachable thermal lining, in order to achieve the protective properties as requested in EN 469, the intermediate moisture barrier is always protected by the thermal liner against abrasion.



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Not so with trousers of level 1 of EN 469:2005 which might have the moisture barrier as innermost lining. In this case the moisture barrier is subject to higher mechanical stress during wear and washing/cleaning, and needs better abrasion strength. Therefore these models are lined with a moisture barrier where the membrane is protected by a strong rear side, preferably from NOMEX® Comfort, instead of non-woven, e.g. E 89 (SONTARA®).

® Du Pont's registered trademark

Washing recommendations for multi-layer PPE containing moisture barrier

(conclusion)

Machine: Washing-/tumbling
Filling ratio: 2/3 capacity of cylinder

Step	Level	Time min	Temperature °C	Turns	Quantity ml/kg	Product
1. Run	medium	8	40		25,0	DERVAL RENT
2. Run	medium	10	60		12,5	DERVAL RENT
Intermediate tumbling	slow	1		500 T/min		
1. Rinsing	high	3	cold			
2. Rinsing	high	3	cold			
Finishing bath	low 1 : 3	10	40		60 resp. 20 ml/l	HYDROB FC
Interval tumbling	2x	1		500 T/min		
Interval tumbling	1x	2		1000 T/min		