

## Fire Fighting Protective Clothing - EN 469:2005 Introduction (1)

Competent and engaged in questions of heat protection ALWIT has been busy from the outset with technical requirements, testing and standardizing of heat protecting materials. Therefore ALWIT obviously took part also to European Standardizing works especially to develop the test methods and minimal requirements for such materials.

**Personal Protective Equipment (PPE)** for thermal risks of more than 100°C belongs to category III of EC - Directive 89/686 (also called Directive for manufacturers).

Therefore each model (type approval) has to be tested by a notified body and manufactured under a certified system for quality safety and control (e.g. ISO 9001); otherwise the type approval has to be renewed annual.

**EN 469:2005** contains requirements on heat protective clothing for firefighters that are partially reproduced hereafter:

### 4.2 Sizes

Sizes are not especially defined or indicated; sizes shall be designated according to **EN 340**.

The following table contains the size designation and dimensions according to EN 340 which are used in ALWIT products.

### 4.5 Two piece suit

There shall be an overlap between the jacket and trousers which shall always remain whilst carrying out the job related exercises during ergonomic and practical performance testing (see e.g. EN 340:2003 and annex D of this standard) whatever the position of the body parts or the movements are during those exercises.

German size	Int. size	ALWIT marking	Body height in cm	Chest width in cm (body)	Waist width in cm (body)
42/44	XS	0	164 - 170	80 - 88	68 - 76
46/48	S	1	170 - 176	88 - 96	76 - 84
50/52	M	2	176 - 182	96 - 104	84 - 92
54/56	L	3	182 - 188	104 - 112	92 - 100
58/60	XL	4	182 - 188	112 - 120	100 - 108
62/64	XXL	5	188 - 194	120 - 128	108 - 116
66/68	XXXL	6	194 - 200	128 - 136	116 - 124

There might be special cases where other additional measurements are useful or even necessary, e.g. sleeve length, inside leg length.

**Note:** German Directive „HuPF“ contains other measurements.

### 5.2 Pre-treatment

Before testing, test specimen shall be pre-treated. The previous version of EN 469 requested generally 5 washing cycles according to ISO 6330, so test results could be compared. In EN 469:2005 the manufacturer has to indicate the pre-treatment.

When comparing test results this fact should be considered because the base might be different.

## Fire Fighting Protective Clothing - EN 469:2005 Introduction (2)

### 6.1 Limited flame spread: DIN EN ISO 15025 A

Afterburn time [s]	Afterglow time [s]	Hole formation	Melting debris
≤ 2	≤ 2	Not allowed, except in intermediate layers	Not allowed

Seams, wristlet materials and hardware are part of the test.

### 6.3 Heat transfer - radiation: DIN EN ISO 6942

Heat flux density [kW / m <sup>2</sup> ]	Radiant Heat Transfer Index = time, to rise temperature inside about 24°C bzw. 12°C			
	(RHTI <sub>24</sub> ) [s]		(RHTI <sub>24</sub> - RHTI <sub>12</sub> ) [s]	
	Level		Level	
	1	2	1	2
40	≥ 10	≥ 18	≥ 3	≥ 4

### 6.2 Heat transfer - flame: DIN EN 367

Heat flux density [kW / m <sup>2</sup> ]	Heat Transfer Index = time, to rise temperature inside about 24°C bzw. 12°C			
	(HTI <sub>24</sub> ) [s]		(HTI <sub>24</sub> - HTI <sub>12</sub> ) [s]	
	Level		Level	
	1	2	1	2
80	≥ 9	≥ 13	≥ 3	≥ 4

### 6.4 Residual strength: DIN EN ISO 13934-1 after exposition to radiant heat acc. to ISO 6942

Heat flux density [kW / m <sup>2</sup> ]	Tensile strength machine direction [N]	Tensile strength cross direction [N]
10	≥ 450	≥ 450

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### 6.5 Heat resistance: DIN EN ISO 17493

Oven temperature [°C]	Duration [min]	Ignition	Melting	Hole formation	Dripping	Shrinkage machine / cross [%]
180	5	no	no	no	no	5 / 5

### 6.6 Tensile strength

Standard	Machine [N]	Cross [N]
Outer shell material DIN EN ISO 13934-1	≥ 450	≥ 450
Main seams DIN EN ISO 13935-2	≥ 225	≥ 225

### 6.7 Tear strength

Standard	Machine [N]	Cross [N]
Outer shell material DIN EN ISO 13937-2	≥ 25	≥ 25

### 6.8 Surface wetting

Standard	Spray rate
DIN EN 24920	≥ 4

### 6.9 Dimensional change

Standard ISO 5077	Machine	Cross
[%]	≤ 3	≤ 3

### 6.10 Penetration by liquid chemicals: EN ISO 6530

Test chemicals	Repellency rate [%]	Penetration to the innermost surface
40 % NaOH bei 20°C	80	no
36 % HCl bei 20°C	80	no
30 % H <sub>2</sub> SO <sub>4</sub> bei 20°C	80	no
100% o-xylen	80	no

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### 6.11 Resistance to water penetration

Waterproofness DIN EN 20811	Level 1	Level 2
[kPa]	<20	≥20

### 6.12 Water vapour resistance

Water vapour resistance DIN EN 31092	Complete material assembly	
	Level 1	Level 2
[m <sup>2</sup> Pa/W]	>30	≤30

### 6.13 Ergonomic requirements

It is recommended to carry out ergonomic assessment by practical performance test as described in Annex D.

### 6.14 Visibility

If retro-reflective and/or fluorescent elements are required they shall meet the requirements of Annex B (EN 471 table 5 or 7).

Minimum area	Retro-reflective material	Fluorescent material
[m <sup>2</sup> ]	≥0,13	≥0,2

### 6.15 Whole garment test (THERMOMAN)

If this optional test is performed, it shall be done on an instrumented manikin and never on subjects using the following exposure conditions according to Annex E:

Heat flux density [kW / m <sup>2</sup> ]	Duration [s]
84	8

## Fire Fighting Protective Clothing - EN 469:2005 Introduction (5)

### 7 Marking

PPE, which correspond to the requirements of EN 469, shall be durable marked according to EN 340.

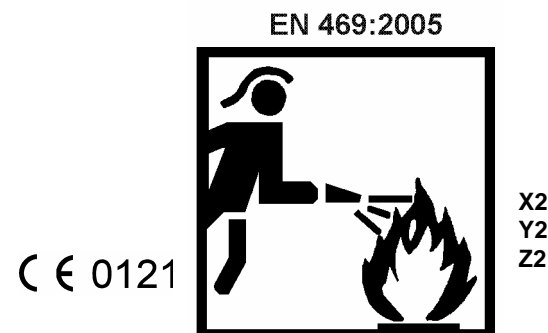
ALWIT products are marked by a label containing the following information:

- Logo, name and address of ALWIT
- Type, product identification number
- CE-conformity sign with number of Notified Body
- Size and/or length
- **ALWIT order confirmation number**
- Pictogram with performance levels
- Care symbols
- if necessary, indication that garments shall be worn together
- if necessary maximum number of washes without re-impregnation of water- and oil repellent surface

The indication of order confirmation number exceeds the requirements of EN 469 and EN 340, allows however within the frame of quality management system ISO 9001:2000 to follow the product back to the roots.

Additional information shall also be enclosed to the smallest packing unit, and moreover information for selection, use, care and maintenance shall be supplied.

Example:



### 8 Information by manufacturer

Par. 8 of EN 469 settles which additional information shall be given by the manufacturer.

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This information given by the ALWIT team is based on our actual knowledge and is not entitled to be complete.

Technical datas are based just on test results of laboratories and may not be transferred right off to the application in practice.

If there would be any further questions, please do not hesitate to contact our experts.