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 via certification

your delivery of  
 2010-02-12

your reference

our reference  
 PVH/3182

date  
 Zwijnaarde, 2010-04-02

**Analysis Report 72927/E**

Required tests :

- Determination of the whole glove integrity
- Determination of the seam strength on existing seam
- Determination of the tear resistance
- Determination of the abrasion resistance with emery paper
- Determination of the puncture resistance
- Determination of the blade cut resistance
- Determination of the gloved finger dexterity
- Determination of the time for the removal of gloves
- Determination of the use of banned azo dyes (HPLC-DAD)
- Washing and drying
- Protective gloves for firefighters
- Burning behaviour

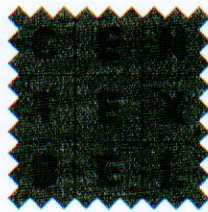
Identification number	Information given by the client	Date of receipt
T001582	B0909 gloves	2010-02-12

Pros Van Hoeyland  
 order responsible

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INRICHTING ERKEND BIJ TOEPASSING VAN DE BESLUITWET VAN 30 JANUARI 1947 / ÉTABLISSEMENT RECONNU PAR APPLICATION DE L'ARRÊTÉ-LOI DU 30 JANVIER 1947



Reference : T001582 - B0909 gloves

Determination of the whole glove integrity

**1. Method:**

Applied standard : EN 511 5.3 (year: 2006)  
ISO 15383 6.4.3 annex A (year: 2001)

Deviations of the standard : -

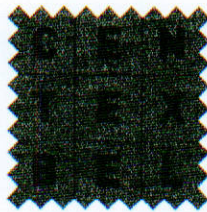
Pretreatment : according ISO 15383 5.4.1 was not carried out

Number of specimens : 3 pair of gloves

**2. Results:**

Date of ending the test: 22-02-2010

specimen	does the glove do fulfil the requirements of the test?
1. left hand (size 9)	no
2. right hand (size 9)	yes
3. left hand (size 9)	yes
4. right hand (size 9)	yes
5. left hand (size 9)	yes
6. right hand (size 9)	yes



Reference : T001582 - B0909 gloves

Determination of the seam strength on existing seam

1. Method:

Applied standard : EN ISO 13935-2 (year: 1999)  
on conditioned material (20°C and 65% rel. humidity)  
Deviations from the standard : -  
Apparatus : Instron, type CRE, class 0,5 - cell of 1 kN  
Distance between the jaws : 100 mm  
Number of test specimen : 5

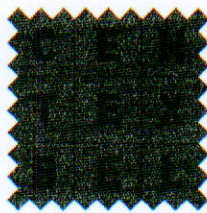
2. Results:

Date of ending the test: 01-04-2010

test specimen	force (in N)
1	845 (4)
2	836 (4)
3	457 (4)
4	491 (4)
5	643 (4)
average	650 N

Remarks:

- (1) fabric tear
- (2) fabric tear at the jaws
- (3) fabric tear at seam
- (4) sewing threads breakage
- (5) threads pull-out
- (6) any combination of (1) up to (5)



Reference : T001582 - B0909 gloves

Determination of the tear resistance

1. Method:

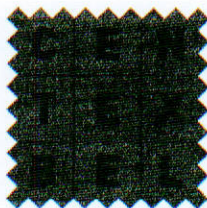
Applied standard : EN 388 part 6.3 (year: 2003)  
on conditioned material (23°C and 50% rel. humidity)  
Deviations of the standard : the test hasn't been carried out in the standard atmosphere,  
but as soon as possible after conditioning  
Apparatus : Instron, type CRE, class 0,5 - cell of 100 N  
Tearing speed : 100 mm/min.  
Number of specimens : 4 different gloves

2. Results:

Date of ending the test: 22-02-2010

Outside layer	
force in the length direction of the glove (N)	force in the width direction of the glove (N)
> 75	69*
> 75	> 75
minimum = 69 N*	
Inside layer	
force in the length direction of the glove (N)	force in the width direction of the glove (N)
> 75	> 75
> 75	> 75
minimum = > 75 N	

Remark: \* = tear transfers.



Reference : T001582 - B0909 gloves

Determination of the abrasion resistance with emery paper

1. Method:

Applied standard : EN 388 part 6.1 (year: 2003)  
on conditioned material (23°C and 50% rel. humidity)

Deviations of the standard : the test hasn't been carried out in the standard atmosphere,  
but as soon as possible after conditioning

Apparatus : Martindale Wear and Abrasion tester

Used pressure : 9 kPa

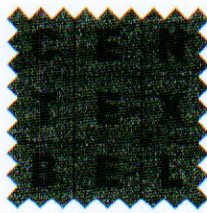
Abrasive paper : F2 (fixed with double-sided adhesive tape)

Number of specimens : 4 circular specimens

2. Results:

Date of ending the test: 23-02-2010

	Outside layer	Inside layer
specimen	$\chi$ = number of cycles to breakdown the sample	$\chi$ = number of cycles to breakdown the sample
1	$2\ 000 < \chi < 8\ 000$	$100 < \chi < 500$
2	$2\ 000 < \chi < 8\ 000$	$100 < \chi < 500$
3	$2\ 000 < \chi < 8\ 000$	$500 < \chi < 2\ 000$
4	$2\ 000 < \chi < 8\ 000$	$500 < \chi < 2\ 000$
minimum	$2\ 000 < \chi < 8\ 000$	$500 < \chi < 2\ 000$



Reference : T001582 - B0909 gloves

Determination of the puncture resistance

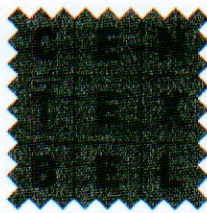
1. Method:

Applied standard : EN 388 part 6.4 (year: 2003)  
on conditioned material (23°C and 50% rel. humidity)  
Deviations of the standard : the test hasn't been carried out in the standard atmosphere,  
but as soon as possible after conditioning  
Apparatus : Instron, type CRE, class 0,5 - cell of 1 kN  
Perforation speed : 100 mm/min.  
Used spike : test spike of steel with rounded top  
Number of specimens : 4

2. Results:

Date of ending the test: 22-02-2010

specimen	force (N)
1	182
2	161
3	114
4	179
minimum	115 N



Reference : T001582 - B0909 gloves

Determination of the blade cut resistance

1. Method:

Applied standard : EN 388 §6.2 (year: 2003)  
on conditioned material (23°C and 50% rel. humidity)  
Deviations of the standard : the test hasn't been carried out in the standard atmosphere,  
but as soon as possible after conditioning  
Apparatus : coupetest with circular blade  
Number of specimens : 4

2. Results:

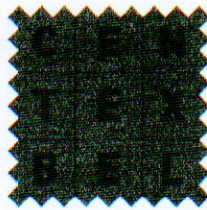
Date of ending the test: 23-02-2010

ref. fabric	T001582 ↗ palm of the glove	ref. fabric	index
1,2	175*	11,4	28,8
1,2	150*	9,4	29,3
1,3	150*	11,3	24,8
			average index: 27,6

ref. fabric	T001582 ↖ palm of the glove	ref. fabric	index
1,3	150*	9,4	29,0
1,4	83,1	9,4	16,4
1,3	126,4	10,3	22,8
			average index: 22,7

Remark: If there is more than half a turn difference between the results of the reference fabric before and after the cutting on the tested sample, on performed only 3 trials each time with a new knife.

\* = manual stop



Reference : T001582 - B0909 gloves

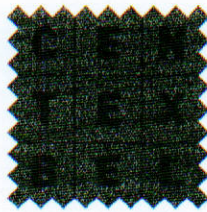
## 2. Results:

Date of ending the test: 23-02-2010

ref. fabric	T001582 ↗ back of the glove	ref. fabric	index
1,2	10,2	1,2	9,5
1,2	11,9	1,2	10,9
1,2	7,1	1,2	6,9
1,2	5,1	1,2	5,3
1,2	4,2	1,2	4,5
			average index: 7,4

ref. fabric	T001582 ↖ back of the glove	ref. fabric	index
1,2	4,2	1,2	4,50
1,2	6,1	1,3	5,9
1,3	9,2	1,3	8,1
1,3	13,3	1,3	11,2
1,3	15,3	1,4	12,3
			average index: 8,4





Reference : T001582 - B0909 gloves

Determination of the gloved finger dexterity

1. Method:

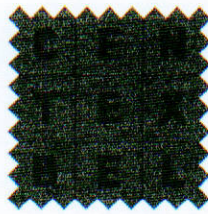
Applied standard : EN 420 part 6.2 (year: 2003)  
The used pins have a length of 40 mm and a diameter of respectively 5 mm, 6,5 mm, 8 mm, 9,5 mm and 11 mm.  
Deviations of the standard : -  
Number of specimens : 4 gloves

2. Results:

Date of ending the test: 22-02-2010

size of the glove	right hand
7	Ø 8
7	Ø 8
7	Ø 9,5
7	Ø 11
smallest pin	Ø 8 mm

Result: the diameter of the smallest pin that could be taken: 8 mm



Reference : T001582 - B0909 gloves

Determination of the time for the removal of gloves

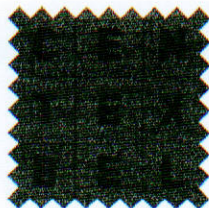
**1. Method:**

Applied method : EN 659 (year: 2003)  
Deviations of the standard : -  
Number of specimens : 3 pairs of gloves  
Conditioning : - dry at 20°C and 65% rel. humidity  
                  - wet conditioning at 20°C for 2 min.  
                  (gloves first filled with water prior to immersion)  
Draining time : 5 min.  
Number of operators : 1

**2. Results:**

Date of ending the test: 22-02-2010

time for the removal of one pair of gloves		
glove size	pair	wet
9	1	2,0
9	2	2,0
10	3	2,0
	mean value	2,0 s
	final result	2 s



**Reference :** T001582 - B0909 gloves

**Determination of the use of banned azo dyes (HPLC-DAD)**

**1. Method**

Standard used : EN 14362-1

Reductive cleavage : The sample is treated with sodium dithionite, in a closed vessel containing a citrate buffered aqueous solution (pH 6) at 70°C. The released amines are transferred using Extrelut columns into a tert-butylmethylether phase. Concentration and transfer to methanol.

Analysis : HPLC with diode array detection, confirmation : UV spectrum

Traced aryl amines : 2,4,5-Trimethylaniline, 2,4-Diaminoanisole, 2,4-Toluyldiamine, 2-Amino-4-nitrotoluene, 2-Naphthylamine, 3,3'-Dimethoxybenzidine, 3,3'-Dimethyl-4,4'-diaminobiphenylmethane, 3,3'-Dimethylbenzidine, 3,3'-Dichlorobenzidine, 4,4'-Diaminobiphenylmethane, 4,4'-Methylene-bis-(2-chloroaniline), 4,4'-Oxydianiline, 4,4'-Thiodianiline, 4-Aminobiphenyl, 4-Chloro-o-toluidine, Benzidine, o-Aminoazotoluene, o-Toluidine, p-Chloroaniline, p-Cresidine 4-Aminoazobenzene (°), o-Anisidine  
(°) Actual scientific knowledge does not allow to identify those dyes that may split off 4-aminoazobenzene.

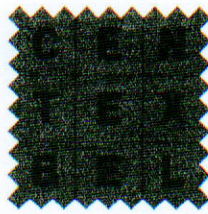
**2. Results**

Date of ending the test : 2010-02-24

Tested colour(s) : black, orange

Determination limit : 20 ppm

Results : There are no carcinogenic aryl amines present in a concentration higher than the determination limit.



**Reference :** T001582 - B0909 gloves

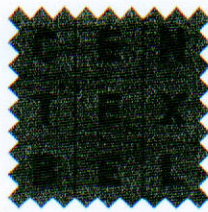
**Washing and drying**

**1. Method:**

Applied standard : ISO 6330 (year: 2000-2008): washing procedure method: 5A  
Deviations of the standard : -  
Washing machine : Wascator type FOM 71  
Number of washing cycles : 5  
Detergent used : ECE - detergent  
Temperature : 40°C  
Drying method : flat dry (after each wash cycle)  
Total mass (test specimens + load) : 2 kg  
Mass of the test specimens : 255 g

**2. Results:**

Date of ending the test: 05-03-2010



Reference : T001582 - B0909 gloves

Protective gloves for firefighters  
Burning behaviour

1. Method:

Test Method - EN 407 § 6.3 (2004)  
Standard - EN 659 (2003)  
Deviations from the standard - /

2. Results:

End of tests: 19 February 2010

*Flame on the thumb*

	3s	15s
afterflame time (s)	0	0
afterglow time (s)	0	0
dripping	no	no
seam destroyed	no	no
melting of innermost layer	no	no

*Flame on top of the finger*

	3s	15s
afterflame time (s)	0	0
afterglow time (s)	0	0
dripping	no	no
seam destroyed	no	no
melting of innermost layer	no	no

*Flame on the other seams*

	3s	15s
afterflame time (s)	0	0
afterglow time (s)	0	0
dripping	no	no
seam destroyed	no	no
melting of innermost layer	no	no

Requirements in accordance with EN 659 (2003) § 3.7

- afterflame time  $\leq$  2s
- afterglow time  $\leq$  5 s
- no dripping
- seams shall not be destroyed (test 15 s)
- no melting of the innermost layer (visual inspection)