Mr. Lasse Granqvist
GRANQVISTS SPORTARTIKLAR AB
Hynboholm 342
SE-655 91 KARLSTAD
ZWEDEN
via certification

your delivery of	your reference	our reference	date
2010-02-12		PVH/3182	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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ISO 17025
BELAC
056-TEST

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CENTEXBEL-GENT
Technologiepark 7
BE-9052 Zwijnaarde
Tel. + 32 9 220 41 51 • Fax + 32 9 220 49 55
e-mail gent@centexbel.be

CENTEXBEL-BRUSSELS
Montoyerstraat 24 B2
BE-1000 Brussels
Tel. + 32 2 287 08 30 • Fax + 32 2 230 68 15

www.centexbel.be

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

Performed in the physical lab under the responsibility of Willy Vande Wiele.

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)

Performed under accreditation in the physical lab under the responsibility of Willy Vande Wiele.

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 > 75	69* > 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	χ = number of cycles to breakdown the sample	χ = 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	$2\,000 < \chi < 8\,000$	$500 < \chi < 2\,000$

Performed under accreditation in the physical lab under the responsibility of Willy Vande Wiele.

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

Performed under accreditation in the physical lab under the responsibility of Willy Vande Wiele.

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

Performed in the physical lab under the responsibility of Willy Vande Wiele.

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

Performed in the physical lab under the responsibility of Willy Vande Wiele.

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	∅ 8
7	∅ 8
7	∅ 9,5
7	∅ 11
smallest pin	∅ 8 mm

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

Performed under accreditation in the physical lab under the responsibility of Willy Vande Wiele.

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

Performed in the physical lab under the responsibility of Willy Vande Wiele.

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-Toluylendiamine, 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.

Performed in the chemical lab under the responsibility of Eddy Albrecht.

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

Performed under accreditation in the fire lab under the responsibility of Pros Van Hoeyland.