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检测
TESTING
CNAS L0599

Test Report

SL52115270560201TX

Date: July 20, 2021

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WEIFANG KONZER SAFETY PROTECTIVE EQUIPMENT CO., LTD.
SOUTH OF 500M, WEST OF INTERSECTION OF WEIAN AND NANYUAN ROAD, ANQIU CITY, SHANDONG
PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the client as:

Sample Description : (A) Protective coverall
Sample Color : (A) White
Composition : (A) PP+PE 63g/m²
Style No. : K2000
Manufacturer : Weifang Konzer Safety Protective Equipment Co., Ltd
Supplier : Weifang Konzer Safety Protective Equipment Co., Ltd
Country of Origin : China
Proposed Care Instruction : -

Test Performed : Selected test(s) as requested by applicant

Sample Receiving Date : Jun 07, 2021

Testing Period : Jun 11, 2021 - Jul 20, 2021

Test Result(s) : Unless otherwise stated the results shown in this test report refer only to the sample(s) tested, for further details, please refer to the following page(s).

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd Testing Center

Sara Guo

Sara Guo (Account Executive)

Helen Xuan

Dongjing Liu / Hailian Xuan (Authorized Signatory)

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Conclusion	A	Remark
Fabric Thickness	SEE RESULTS	

Personal Protective Equipment - Protective Clothing - General Requirements (EN ISO 13688:2013)

Conclusion	A	Remark
Clause 4.2 pH Value of Aqueous Extract	PASS	
Clause 4.2 Nickel Release	PASS	

**Personal Protective Equipment - Protective Clothing- Electrostatic Properties- Part 5: Material Performance and Design requirements (EN 1149-5:2008)**

Conclusion	A	Remark
Clause 4.2.1 Electrostatic Material Requirements	PASS	

Protective Clothing Against Radioactive Contamination-Part 2: Requirements and Test Methods for Non-Ventilated Protective Clothing against Particulate Radioactive Contamination (EN 1073-2:2002)

Conclusion	A	Remark
Clause 4.2 Abrasion Resistance	Class 1	
Clause 4.2 Puncture Resistance	No classification	
Clause 4.2 Resistance to Blocking	Class 2	
Clause 4.2 Tear Resistance	Class 3	
Resistance To Ignition	FAIL	
Clause 4.3 Nominal Protection Factor of Whole Suit	Class 1	
Clause 4.4.1 Seam Strength	Class 3	

Remark(s) : PASS=Meet General Requirement
FAIL=Below General Requirement



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Comment

	EN ISO 13982-1:2004+A1:2010 (Type 5)	EN 13034:2005+A1:2009 (Type 6)	EN 14126:2003/AC:2004
Abrasion Resistance	Class 1	Class 1	Referring to Type 5/ Type 6 comment
Compression-Folding (Schildknecht) Flex Cracking Resistance	Class 6	/	
Compression-Folding (Schildknecht) Flex Cracking Resistance at -30°C	Class 6	Class 6	
Trapezoidal Tear Resistance	Class 2	Class 2	
Tensile Strength	/	Class 1	
Puncture Resistance	Class 1	Class 1	
Repellency by Liquids(30% H ₂ SO ₄)	/	Class 3	
Repellency by Liquids(10% NaOH)	/	Class 3	
Repellency by Liquids(o-Xylene)	/	Class 3	
Repellency by Liquids(Butan-1-ol)	/	Class 3	
Resistance to Penetration by Liquids(30% H ₂ SO ₄)	/	Class 3	
Resistance to Penetration by Liquids(10% NaOH)	/	Class 3	
Resistance to Penetration by Liquids(o-Xylene)	/	Class 3	
Resistance to Penetration by Liquids(Butan-1-ol)	/	Class 3	
Seam Strength	Class 3	Class 3	Class 6:20kPa Pass
Whole Suits Testing	Pass	Pass	
Resistance to penetration by contaminated liquids under hydrostatic pressure	/	/	Class 6
Resistance to penetration by infective agents due to mechanical contact with substances containing contaminated liquids	/	/	Class 3
Resistance to penetration by contaminated liquid aerosols	/	/	Class 3
Resistance to penetration by contaminated solid particles	/	/	

Remark: Pass = Meet Relative Standard Requirement



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COMPONENT LIST / List of Materials

Sample No.	Component No.	Description	Remark
A	1	body fabric	
A	2	zipper head	



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Test Result

Fabric Thickness

(ISO 9073-2:1995+Cor.1:1998; Method A)

	Unit	A-fabric	A-seam
Thickness	mm	0.29	1.31

Personal Protective Equipment - Protective Clothing - General Requirements

EN ISO 13688:2013

Clause 4.2 pH Value of Aqueous Extract

(ISO 3071:2005; 0.1mol/L KCL extraction)

	Unit	1	Requirement
pH Value	-	8.9	3.5-9.5
Conclusion		PASS	

Note:

- 1) pH value of extraction medium: 5.6
- 2) Temperature of the extraction solution: 20.3°C



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Clause 4.2 Nickel release

Test Method : As specified in EN 1811:2011+ A1:2015, analysis was performed by ICP-OES

Test Item(s)

Volume of Test Solution

Sample Area

Whether performed by EN 12472:2020 or not

Nickel Release - Trial 1

Nickel Release - Trial 2

Nickel Release - Trial 3

Conclusion

2
3.20 mL
3.20 cm²
YES
ND
ND
ND
PASS

Notes :RL (Reporting limit)=0.10µg/cm²/week

ND = Not Detected (< RL)

(1) NO: As Nickel is found to be positive by CR 12471:2002, simulation of wear and corrosion by the EN 12472:2020 is not performed

YES: As Nickel is found to be negative by CR 12471:2002, simulation of wear and corrosion by the EN 12472:2020 is performed

Comments are given according to Annex A of EN1811:2011+ A1:2015 as below:

Type of sample	Nickel Release (µg/cm ² /week)	
	PASS	FAIL
Article with Nickel release limit of 0.5µg/cm ² /week	<0.88	≥ 0.88
Article with Nickel release limit of 0.2µg/cm ² /week	<0.35	≥ 0.35

Personal Protective Equipment - Protective Clothing- Electrostatic Properties- Part 5: Material Performance and Design requirements

EN 1149-5:2008

Clause 4.2.1 Electrostatic Material Requirements

(EN 1149-1:2006; Test Condition: Applied Voltage and time: 100V for 15 seconds Temperature: 23±1°C; Relative Humidity: 25±5%)

A	Unit	Face Side	Back Side	Requirement
As Received				
Surface Resistance	Ω	3.4x10 ⁷	1.8x10 ⁷	Max.2.5x10 ⁹ Ω on at least one surface



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Protective Clothing Against Radioactive Contamination-Part 2: Requirements and Test Methods for Non-Ventilated Protective Clothing against Particulate Radioactive Contamination

EN 1073-2:2002

Section-1-Clause 4.2 Materials

Clause 4.2 Abrasion Resistance

(EN 530:2010; Method 2, Martindale Wear & Abrasion Tester, 9kPa Pressure, Grade No. 00 abrasion paper)

A					
<u>As Received</u>	No. 1	No. 2	No. 3	No. 4	Minimum
Endpoint(Rubs)	49	55	60	58	49

Recommended class: Class 1

Remark:

Classification of abrasion resistance for the materials: Class 1 >10rubs; Class 2 >100rubs; Class 3 >500rubs; Class 4 >1000rubs; Class 5 >1500rubs; Class 6 >2000rubs.

Clause 4.2 Puncture Resistance

(EN 863:1995;)

A					
<u>As Received</u>	No. 1	No. 2	No. 3	No. 4	Minimum
Puncture Force(N)	9	9	9	10	9

Recommended class: No classification

Remark:

Classification of puncture resistance for the materials: Class 2 >10N; Class 3 >50N; Class 4 >100N.

Clause 4.2 Resistance to Blocking

(EN 25978:1993; Test Condition : Test specimen was under 5.0 kg and expose to the temperature of 70±2 °C for 3 hours.)

A	Unit	Back to back	Face to face	Back to face
<u>As Received</u>				
Rate of the blocking resistance	No Unit	No blocking	No blocking	No blocking

Recommended class: Class 2

Remark:

Classification of resistance to blocking for the materials: Class 1 -Blocking, Class 2 -No blocking.



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Clause 4.2 Tear Resistance

(ISO 9073-4:1997;)

A

As received	No. 1	No. 2	No. 3	No. 4	No. 5
Length (N)	25	27	27	25	27
Width (N)	62	59	64	60	67

Minimum

25
59

Recommended class: Class 3

Remark:

Classification of tear resistance for materials: Class 1 >2N; Class 2 >10N; Class 3 >20N; Class 4 >40N; Class 5 >80N; Class 6 >150N.

Clause 4.2 Resistance to Ignition

(EN 13274-4: 2001 Method 3, Flame temperature 800±50°C with a speed of (60±5) mm/s, gas used: Propane)

As received

	Length direction			Cross direction		
	# 1	# 2	# 3	# 1	# 2	# 3
Continue to burn	Y	Y	Y	Y	Y	Y
Conclusion	Fail					

Remark: Y: yes; N: no

Requirement: Not continue to burn

Clause 4.3 Nominal Protection Factor of Whole Suit

(EN ISO 13982-2:2004)

Sample A

	Description		
Undergarment:	cotton long trousers and a T-shirt with long sleeves		
Additional equipment:	/		
The physical dimensions of the wearers are shown below			
Tested Subjects	Total Height(cm)	Chest girth(cm)	Suit size
Chen	180	120	XL
Luo	180	92	XL
Lu	180	106	XL



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Individual result of inward leakage at three sampling positions:

Subject	Exercise	Sample position/ Feeding-in position			Average per exercise (%)
		Knee / Chest	Waist back/ Knee	Chest/ Waist back	
1	Standing still	4.0	3.8	3.9	3.9
	Walking	4.1	4.4	4.4	4.3
	Squatting	5.0	5.1	4.7	4.9
	Average per sampling position (%)	4.4	4.4	4.3	4.4
1	Standing still	3.8	4.2	3.8	3.9
	Walking	4.1	4.5	4.2	4.3
	Squatting	4.7	5.0	5.0	4.9
	Average per sampling position (%)	4.2	4.6	4.3	4.4
2	Standing still	3.9	4.0	4.1	4.0
	Walking	4.1	3.9	4.3	4.1
	Squatting	5.0	4.6	4.9	4.8
	Average per sampling position (%)	4.3	4.2	4.4	4.3
2	Standing still	3.5	3.8	3.5	3.6
	Walking	4.5	4.1	4.1	4.2
	Squatting	4.6	5.3	4.5	4.8
	Average per sampling position (%)	4.2	4.4	4.0	4.2
3	Standing still	4.2	3.8	3.8	3.9
	Walking	3.7	4.3	4.5	4.2
	Squatting	5.3	5.0	5.3	5.2
	Average per sampling position (%)	4.4	4.4	4.6	4.4
3	Standing still	4.0	4.0	4.1	4.1
	Walking	4.6	3.7	4.1	4.2
	Squatting	5.0	4.9	4.4	4.8
	Average per sampling position (%)	4.6	4.2	4.2	4.3

The average value of each exercise (TILE) and of all measurements (TILA):

Exercise	Sample position/ Feeding-in position			Average value for each exercise TILE (%)
	Knee / Chest	Waist back/ Knee	Chest/ Waist back	
Standing still	3.9	3.9	3.9	3.9
Walking	4.2	4.2	4.3	4.2
Squatting	4.9	5.0	4.8	4.9
Average value for all exercise TILA (%)				4.3
Nominal protection factor = 100: TILA				23.0
Recommended Class				1



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Requirement: Total Inward Leakage

Class	Mean value of inward leakage at the three sampling positions inside the suit during exercise of		Nominal protection factor
	one activity (TILE) %	all activity (TILA) %	
3	0.3	0.2	500
2	3	2	50
1	30	20	5



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Full dressed wearer for whole suit performance testing



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Clause 4.4.1 Seam Strength

(EN ISO 13934-2:2014 Modified)

	# 1	# 2	# 3	Average
In-side seam (N)	136(F.T.S.)	142(F.T.S.)	136(F.T.S.)	138(F.T.S.)
Sleeve seam (N)	143(F.R.)	143(F.R.)	148(F.R.)	145(F.R.)
Back trousers seam (N)	118(F.T.S.)	103(F.T.S.)	113(F.T.S.)	111(F.T.S.)
Crotch seam (N)	76(F.T.S.)	95(F.T.S.)	112(F.T.S.)	94(F.T.S.)

Class

3

Notes

F.R. = Fabric Rupture;

F.T.S.= Fabric Tear at Seam

Remark:

Classification of seam strength: Class 1 >30N; Class 2 >50N; Class 3 >75N; Class 4 >125N; Class 5 >300N.

Personal Protective Equipment - Protective Clothing Against Chemicals -Test Methods and Performance Classification of Chemical Protective Clothing Materials, Seams, Joins and Assemblages

EN 14325:2018

Clause 4.4 Abrasion Resistance

(EN ISO 12947-2:2016;Martindale Abrasion & Pilling Tester, Pressure: 9kPa, Grit 240 abrasion paper.)

A

As Received

The quoted result(Rubs)

No. 1

No. 2

No. 3

No. 4

No. 5

Minimum

>10

>10

>10

>10

>10

>10

Method for end-point determination: Hydrostatic headmethod

Recommended Class:1

Remark:

- 1) Pressure pot method is used for damage assessment before and after abrasion, as given in EN 14325:2018 clause 4.4.2.2. And the maximum resultant value does not exceed 100 Pa in 1 min.
- 2) Hydrostatic head method is used to damage assessment after abrasion, as given in EN 14325:2018 Clause 4.4.2.3, due to the performance of the material could not be evaluated by the pressure pot method. And the average hydrostatic head is above 200mm.
- 3) Visual inspection is used for damage assessment after abrasion, as given in EN 14325:2018 clause 4.4.2.4, due to the performance of the material could not be evaluated by the pressure pot method or hydrostatic head method. If the determination is performed through visual inspection, the maximum classification that can be claimed is a Class 3.
- 4) Classification of abrasion resistance: Class 1 >10rubs; Class 2 >40rubs; Class 3 >100rubs; Class 4 >400rubs; Class 5 >1000rubs; Class 6 >2000rubs.



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Clause 4.5 Compression-Folding (Schildknecht) Flex Cracking Resistance

(EN ISO 7854:1997, Method B;)

A

As Received	No. 1	No. 2	No. 3	Minimum
Warp/Lengthwise(Cycles)	>50000	>50000	>50000	>50000
Weft/Widthwise(Cycles)	>50000	>50000	>50000	>50000

Method for end-point determination: Hydrostatic head method

Recommended Class: 6

Remark:

- 1) Pressure pot method is used for damage assessment before and after flex cracking, as given in EN 14325:2018 clause 4.5.2.2. And the maximum resultant value does not exceed 100 Pa in 1 min.
- 2) Hydrostatic head method is used to damage assessment after abrasion, as given in EN 14325:2018 Clause 4.5.2.3, due to the performance of the material could not be evaluated by the pressure pot method. And the average hydrostatic head is above 200mm.
- 3) Visual inspection is used for damage assessment after flex cracking, as given in EN 14325:2018 clause 4.5.2.4, due to the performance of the material could not be evaluated by the pressure pot method or hydrostatic head method. Visual inspection shall not be used for the performance classification of Type 1 through Type 3 (EN 943-1, EN 943-2, EN 14605)
- 4) Classification of leak tightness after compression-folding (Schildknecht) flex cracking resistance: Class 1 >500cycles; Class 2 >1250cycles; Class 3 >3000cycles; Class 4 >8000cycles; Class 5 >20000cycles; Class 6 >50000cycles.

Clause 4.6 Compression-Folding (Schildknecht) Flex Cracking Resistance at -30°C

(EN ISO 7854:1997, Method B;)

A

As Received	No. 1	No. 2	No. 3	Minimum
Warp/Lengthwise(Cycles)	>4000	>4000	>4000	>4000
Weft/Widthwise(Cycles)	>4000	>4000	>4000	>4000

Method for end-point determination: Hydrostatic head method

Recommended Class: 6

Remark:

- 1) Pressure pot method is used for damage assessment before and after flex cracking, as given in EN 14325:2018 clause 4.5.2.2. And the maximum resultant value does not exceed 100 Pa in 1 min.
- 2) Hydrostatic head method is used to damage assessment after abrasion, as given in EN 14325:2018 Clause 4.5.2.3, due to the performance of the material could not be evaluated by the pressure pot method. And the average hydrostatic head is above 200mm.
- 3) Visual inspection is used for damage assessment after flex cracking, as given in EN 14325:2018 clause 4.5.2.4, due to the performance of the material could not be evaluated by the pressure pot method or hydrostatic head method. Visual inspection shall not be used for the performance classification of Type 1 through Type 3 (EN 943-1, EN 943-2, EN 14605)
- 4) Classification of compression-folding (Schildknecht) flex cracking resistance at low temperatures: Class 1 >100cycles; Class 2 >200cycles; Class 3 >500cycles; Class 4 >1000cycles; Class 5 >2000cycles; Class 6 >4000cycles.



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Clause 4.7 Trapezoidal Tear Resistance

(EN ISO 9073-4:1997;)

A	No. 1	No. 2	No. 3	No. 4	No. 5	Minimum
<u>As Received</u>						
Warp/Length Yarns	25	27	27	25	27	25
Torn(N)						
Weft/Width Yarns	62	59	64	60	67	59
Torn(N)						

Recommended Class: 2

Remark:

Classification of trapezoidal tear resistance: Class 1 >10N; Class 2 >20N; Class 3 >40N; Class 4 >60N; Class 5 >100N; Class 6 >150N.

Clause 4.9 Tensile Strength

(EN ISO 13934-1:2013; CRE - 2" Strip)

A	No. 1	No. 2	No. 3	No. 4	No. 5	Minimum
<u>As Received</u>						
Warp/Length(N)	55	59	56	54	55	54
Weft/Width(N)	130	140	140	130	140	130

Recommended Class: 1

Remark:

Classification of tensile strength: Class 1 >30N; Class 2 >60N; Class 3 >100N; Class 4 >250N; Class 5 >500N; Class 6 >1000N.

Clause 4.10 Puncture Resistance

(EN 863:1995;)

A	No. 1	No. 2	No. 3	No. 4	No. 5	Minimum
<u>As Received</u>						
Puncture Force(N)	9	9	9	10	10	9

Recommended Class: 1

Remark:

Classification of puncture resistance: Class 1 >5N; Class 2 >10N; Class 3 >50N; Class 4 >100N; Class 5 >150N; Class 6 >250N.



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Clause 4.12 Repellency by Liquids
(EN ISO 6530:2005)

Test Liquid	Repellency Index (%)	# 1	# 2	# 3	Min.	Recommended Class
30% H ₂ SO ₄	Warp/One direction	98.1	98.4	98.2	98.1	3
	Weft/The other direction	98.2	98.2	98.2		
10% NaOH	Warp/One direction	98.1	98.2	98.1	98.0	3
	Weft/The other direction	98.0	98.2	98.9		
o-Xylene	Warp/One direction	94.8	95.1	95.1	94.8	3
	Weft/The other direction	95.1	95.0	95.2		
Butan-1-ol	Warp/One direction	97.4	97.7	97.7	97.4	3
	Weft/The other direction	97.5	97.6	97.6		

Remark: Classification of repellency to liquids: Class 1 >70%; Class 2 >80%; Class 3 >90%.

Clause 4.13 Resistance to Penetration by Liquids
(EN ISO 6530:2005)

Test Liquid	Penetration Index (%)	# 1	# 2	# 3	Max.	Recommended Class
30% H ₂ SO ₄	Warp/One direction	0	0	0	0	3
	Weft/The other direction	0	0	0		
10% NaOH	Warp/One direction	0	0	0	0	3
	Weft/The other direction	0	0	0		
o-Xylene	Warp/One direction	0	0	0	0	3
	Weft/The other direction	0	0	0		
Butan-1-ol	Warp/One direction	0	0	0	0	3
	Weft/The other direction	0	0	0		

Remark: Classification of resistance to penetration by liquids: Class 1 <10%; Class 2 <5%; Class 3 <1%.

Clause 5.5 Seam Strength
(EN ISO 13935-2:2014)

	# 1	# 2	# 3	Average
In-side seam (N)	136(F.T.S.)	142(F.T.S.)	136(F.T.S.)	138(F.T.S.)
Sleeve seam (N)	143(F.R.)	143(F.R.)	148(F.R.)	145(F.R.)
Back trousers seam (N)	118(F.T.S.)	103(F.T.S.)	113(F.T.S.)	111(F.T.S.)
Crotch seam (N)	76(F.T.S.)	95(F.T.S.)	112(F.T.S.)	94(F.T.S.)
Recommended Class	3			

Notes F.R. = Fabric Rupture; F.T.S. = Fabric Tear at Seam

Remark:

Classification of seam strength: Class 1 >30N; Class 2 >50N; Class 3 >75N; Class 4 >125N; Class 5 >300N; Class 6 >500N.



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Protective Clothing for Use against Solid Particulates - Part 1: Performance Requirements for Chemical Protective Clothing Providing Protection to The Full Body Against Airborne Solid Particulates (Type 5 Clothing)

(EN ISO 13982-1:2004+A1:2010)

Clause 4.3 Performance Requirements for Whole Suits-Types 5 (Inward Leakage Test)

Sample A

Clause 4.3.1- General



Requirement	Result	Comment
Type 5 clothing is of the "full-body" type, i.e. it provides protection to at least the trunk, arms and legs, and consists of a one-piece coverall or a two-piece suits. Head protection, e.g. a hood with visor, and/or foot protection may be worn additionally.	Comply	Pass

	Description		
Undergarment:	cotton long trousers and a T-shirt with long sleeves		
Additional equipment:	/		
The physical dimensions of the wearers are shown below			
Tested Subjects	Total Height(cm)	Chest girth(cm)	Suit size
Huang	178	109	XL
Shen	180	112	XL
Xu	178	110	XL
Yuan	179	111	XL
Qin	177	112	XL

Prior to testing each suit in accordance with EN ISO 13982-2:2004, a practical test shall be carried out by a human test subject. The test shall comprise three repetitions, at moderate speed, of the "three movement" sequence described in below. If the test subject is not able to perform one or several movements due to the hindrance of the suit or if the movements result in substantial damage to the suit, the suit shall be considered to have failed.

Sequence of movements according to standard

Test sample	Assessment after Movements
1	Pass
2	Pass
3	Pass
4	Pass
5	Pass
6	Pass
7	Pass
8	Pass
9	Pass
10	Pass



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Remark:

- Movement 1: Kneel on both knees, lean forward and place both hands on the floor 45 cm in front of the knees. Crawl forward on hands and knees over a distance of 3 m and crawl backwards again over the same distance.
- Movement 2: Stand with feet shoulder width apart, arms at side. Raise arms until they are parallel to the floor in front of the body. Squat down as far as possible.
- Movement 3: Kneel on right knee, place left foot on floor with left knee bent 90°, left arm hanging loosely at side. Raise left arm fully overhead.

Clause 4.3.2- Inward Leakage of Aerosols of Solid Particles
(EN ISO 13982-2:2004)

The inward leakage value, expressed in percent

Ordination	Value	Ordination	Value	Ordination	Value	Ordination	Value	Ordination	Value	Ordination	Value
1	3.4	16	3.8	31	3.9	46	4.1	61	4.5	76	5.0
2	3.4	17	3.8	32	3.9	47	4.2	62	4.5	77	5.1
3	3.4	18	3.8	33	3.9	48	4.2	63	4.5	78	5.1
4	3.4	19	3.8	34	3.9	49	4.3	64	4.6	79	5.1
5	3.4	20	3.8	35	4.0	50	4.3	65	4.7	80	5.1
6	3.4	21	3.8	36	4.0	51	4.3	66	4.7	81	5.1
7	3.5	22	3.8	37	4.0	52	4.3	67	4.8	82	5.1
8	3.5	23	3.8	38	4.0	53	4.4	68	4.8	83	5.2
9	3.6	24	3.9	39	4.0	54	4.4	69	4.9	84	5.2
10	3.6	25	3.9	40	4.0	55	4.4	70	4.9	85	5.2
11	3.6	26	3.9	41	4.0	56	4.4	71	4.9	86	5.3
12	3.6	27	3.9	42	4.0	57	4.4	72	4.9	87	5.3
13	3.7	28	3.9	43	4.1	58	4.4	73	4.9	88	5.3
14	3.7	29	3.9	44	4.1	59	4.4	74	5.0	89	5.3
15	3.8	30	3.9	45	4.1	60	4.5	75	5.0	90	5.3
The inward leakage value - $L_{mn,82/90}$					5.1						

The "total inward leakage per suit" value

Ordination	Value	Ordination	Value
1	4.2	6	4.3
2	4.2	7	4.3
3	4.2	8	4.4
4	4.2	9	4.4
5	4.3	10	4.4
The "total inward leakage per suit" value - $L_{s,8/10}$		4.4	



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Requirement:

When tested accordance with EN ISO 13982-2, the type 5 protective clothing shall be characterized by the following parameters:

- $L_{\text{mn},82/90}$: the inward leakage value, expressed in percent, corresponding to the 82nd L value of 90, i.e. the inward leakage values measured over all exercises, all sampling positions, all suits and sorted in ascending order;
- $L_{\text{S},8/10}$: the "total inward leakage per suit" value, corresponding to the 8th Ls value of 10, i.e. the Ls values of all suits sorted in ascending order.

Type 5 chemical protective clothing shall meet at least the following requirements:

- $L_{\text{mn},82/90} \leq 30\%$;
- $L_{\text{S},8/10} \leq 15\%$

Comment: The submitted samples complies with the requirements of EN ISO 13982-1:2004+A1:2010 Clause 4.3 whole Suits Test for Type 5

Protective Clothing Against Liquid Chemicals - Performance Requirements for Chemical Protective Clothing Offering Limited Protective Performance Against Liquid Chemicals (Type 6 and Type PB [6] Equipment)

(EN 13034:2005+A1:2009)

Clause 5 Performance Requirements for Whole Suits-Type 6

Clause 5.1 General

Test Requirement	Results	Comment
The design of the clothing shall guarantee that there are no features which may collect liquid chemicals and hold them onto the fabric surface, e.g. unprotected pockets etc	Comply	Pass

Clause 5.2 Resistance to Penetration by Liquids in The Form of A Light Spray (Mist Test)

(EN ISO 17491-4:2008 Method A: low-level spray test)

	Description		
Absorbent overall:	Nonwovens		
Additional equipment:	/		
Tested Subjects	Total Height(cm)	Chest girth(cm)	Suit size
Lu	180	105	XL

Prior to testing protective suits in accordance with a variant of EN ISO 17491-4, a sequence of seven movements (described below) shall be carried out by a human test subject. The test shall comprise three repetitions of the "seven movements" sequence. If the test subject is not able to perform the test due to the hindrance of the suit or if the test results in substantial damage to the suit, the suit will be considered to have failed.

Sequence of movements according to standard

Test sample	Assessment after Movements
1	Pass
2	Pass
3	Pass



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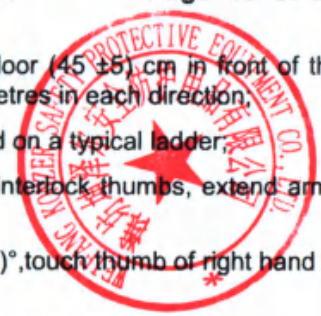
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Remark:

- Movement 1: Kneel on both knees, lean forward and place both hands on the floor (45 ± 5) cm in front of the knees; crawl forward and backwards on hands and knees for a distance of three metres in each direction;
- Movement 2: climb a vertical ladder at least four steps, rungs to be as encountered on a typical ladder;
- Movement 3: position hands at chest level, palms out; reach directly overhead, interlock thumbs, extend arms fully upwards;
- Movement 4: kneel on right knee, place left foot on floor with left knee bent (90 ± 10)°, touch thumb of right hand to toe of left shoe;
- Movement 5: extend arms fully in front of body, lock thumbs together, twist upper body (90 ± 10)° left and right;
- Movement 6: stand with feet shoulder width apart, arms at side; raise arms until they are parallel to the floor in front of the body; squat down as far as possible;
- Movement 7: kneel as in movement 4, left arm hanging loosely at side; raise arm fully overhead.



Test sample	Calibrated Stain area (cm ²)	Total stain area on undergarment (cm ²)	Conclusion
1	3.60	0	Pass
2	3.60	0	Pass
3	3.60	0	Pass

Remark: All suits shall pass the test, i.e. there shall be no penetration of any suit, i.e. the total stain area on the undergarment shall be less than or equal to three times the total calibrated stain area.

Comment: The submitted samples complies with the requirements of EN 13034:2005+A1:2009 Clause 5 whole Suits Test for Type 6



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Full dressed wearer for whole suit performance testing



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Personal Protective Equipment - Protective Clothing - Performance Requirements and Tests Methods for Protective Clothing against Infective Agents

EN 14126:2003/AC:2004

Clause 4.1.4 Performance Requirements against Penetration by Infective Agents

Clause 4.1.4.1 Resistance to Penetration by Blood under Hydrostatic Pressure

Test Method :	ISO 16604:2004
Product standard	EN 14126:2003/AC:2004
Number of test specimens :	3
Test specimens side tested :	outside
Dimension of the test specimens :	7.5 cm x 7.5cm
Test specimens sealed :	Yes
Test specimens conditioning :	21 ± 5°C and 60±10% RH for a minimum of 24 hours
Test procedure used :	D (5min 0kPa+5min 20kPa)
Retaining screen specification:	Metal square mesh screen (open area >50%), limiting the deflection of the sample to ≤ 5.0 mm
Compatibility ratio :	2.1
Starting bacteriophage challenge titer (PFU/ml) :	5.1×10 ⁸
Ending bacteriophage challenge titer (PFU/ml) :	4.9×10 ⁸
Environmental plate results (PFU/ plate) :	0 PFU on each settle plate

Test/Parameter	Specification	Test specimen	Result			Conclusion
			Visual penetration	Titer (PFU/ml)	Test result	
Penetration of Phi-X174 Bacteriophage	Class 6: 20kPa	#1 Front	No penetration	<1	Pass	Class 6:20kPa Pass
		#2 Sleeve	No penetration	<1	Pass	
		#3 Thigh	No penetration	<1	Pass	
		Negative control	No penetration	<1	Acceptable	
		Positive control	Penetration	TNTC	Acceptable	

*A value of <1 PFU/ ml is reported for assay plates showing no plaques.
TNTC= PFUs were too numerous to count.





Test Report

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Clause 4.1.4.2 Resistance to penetration by infective agents due to mechanical contact with substances containing contaminated liquids

Test Item: Wet microbial penetration

Standard used: ISO 22610:2006

Product Standard: EN 14126:2003/AC:2004

Check (Performance monitoring): 20210610

Test condition: Temperature: 21.7°C Humidity: 76.5%

Distance between agar surface to plate rim: 2.99 mm

Dimension of the test specimens: 25cm* 25cm

Number of the test specimens: 5

Covering material: HDPE film

Carrier material: Polyurethane film supplied by Schuett-biotec GmbH

Bacterial strain: Staphylococcus aureus ATCC 29213 2.3×10^4 CFU/mL

Result:

Plate Number	Test Specimen 1# CFU/plate	Test Specimen 2# CFU/plate	Test Specimen 3# CFU/plate	Test Specimen 4# CFU/plate	Test Specimen 5# CFU/plate
Plate 1 (15min) X1	0	0	0	0	0
Plate 2 (30min) X2	0	0	0	0	0
Plate 3 (45min) X3	0	0	0	0	0
Plate 4 (60min) X4	0	0	0	0	0
Plate 5 (75min) X5	0	0	0	0	0
Plate 6 (without donor) Z	21	29	19	24	17
Recommended Class	6				

According to EN 14126:2003/AC:2004 :

Classification	Breakthrough time, t (min)	Class 6: $t > 75\text{min}$; Class 5: $60 < t \leq 75\text{min}$; Class 4: $45 < t \leq 60\text{min}$; Class 3: $30 < t \leq 45\text{min}$; Class 2: $15 < t \leq 30\text{min}$; Class 1: $t \leq 15\text{min}$;
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Remark(s): The classification is based on the worst case.



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Clause 4.1.4.3 Resistance to penetration by contaminated liquid aerosols

Test Method (s)

EN 14126:2003/AC:2004 Protective clothing - Performance requirements and tests methods for protective clothing against infective agents

ISO/DIS 22611:2003 Clothing for protection against infectious agents — Test method for resistance to penetration by biologically contaminated aerosols

The test conditions:

Test bacteria: The fourth generation of *Staphylococcus aureus* ATCC 6538,

The concentration of the bacterial suspension: 5.5×10^7 CFU/ml

Sampling: (2 x 4) test specimens as 25 mm diameter circles

Side in contact with the aerosol: Out side

Pretreatment: Sterilize the test specimens by exposure to UV light (254nm) for 30min per side.

Vacuum controller: 700 mbar (pressure difference of 300 mbar)

laboratory test conditions : Temperature : 20.1°C; Relative humidity :60.4%

Test Result

Specimen	Control (CFU)	Specimen (CFU)	Colonies Ratio	Penetration ratio (log)
1	3.4×10^5	<1	3.4×10^5	>5
2	3.1×10^5	<1	3.1×10^5	>5
3	2.9×10^5	<1	2.9×10^5	>5
4	2.8×10^5	<1	2.8×10^5	>5
Penetration ratio (log) Mean			>5	
SD			0	
Recommended Class			3	

Comments:

1. Sampling sites: 1. Abdomen; 2. Left leg. 3: Right sleeve; 4: Back.

2. Colonies Ratio is the ratio of the background bacterial count to the number of bacteria passed through the test specimen.

3. Classification of resistance to penetration by contaminated liquid aerosols of EN 14126:2003/AC:2004

Class	Penetration ratio (log)
3	$\log > 5$
2	$3 < \log \leq 5$
1	$1 < \log \leq 3$



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Clause 4.1.4.4 Resistance to penetration by contaminated solid particles

Test Method (s)

EN 14126:2003/AC:2004 Protective clothing - Performance requirements and tests methods for protective clothing against infective agents

ISO 22612:2005 Clothing for protection against infectious agents — Test method for resistance to dry microbial penetration

Test Result:

(The fourth generation of spores of bacillus subtilis ATCC 9372, the concentration of the spores: 3.7×10^8 CFU/g talcum powder, Sample: 12, Vibration frequency: 20800 times/min, Vibration time: 30min)

Material

Sample	Measured value (CFU)	Classification
1	0	3
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	
The median (Md)	0	1
The upper quartile (Uq)	0	
Penetration (log cfu)	<1	

Classification of EN 14126:

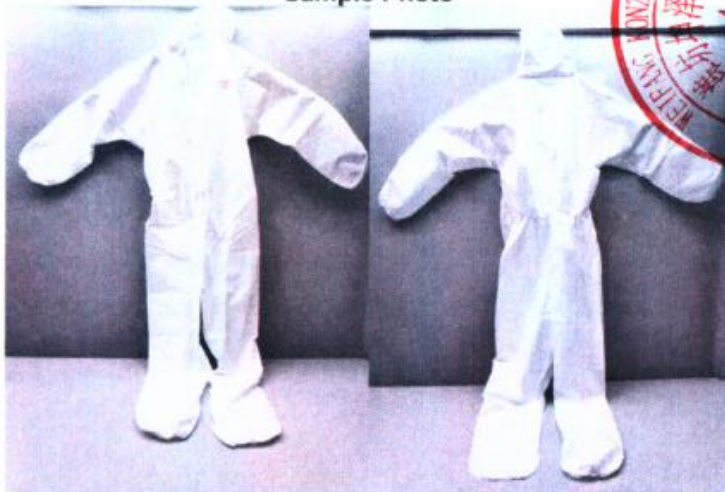
Class	Penetration (log cfu)
3	≤ 1
2	$1 < \log \text{ cfu} \leq 2$
1	$2 < \log \text{ cfu} \leq 3$



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Sample Photo



Face

Back

Product information is provided by applicant without verification of authentication of the brand.

The statement of conformity in this test report is only based on measured values by the laboratory and does not take their uncertainties into consideration.

End of Report



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