WUJIANG TUTAIKE TEXTILES & FINISHING CO.,LTD
NO.1599, SOUTH 3RD RING ROAD, SHENGZE, WUJIANG, SUZHOU, JIANGSU

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

Sample Description	:	(A)Disposable Medical Protective Clothing
Sample Color	:	(A)white
Composition	:	(A)PP+PE
Style No.	:	TTK-A01
Lot No.	:	TTK-20200816, TTK-20200818,TTK-20200820
Manufacturer	:	Wujiang Tutaike Textiles & Finishing Co.,Ltd
Country of Origin	:	China
Country of Destination	:	United States,Europe
Other Info.	:	Sample Dimension: 175 / Modal No.: M / Lot Size: 3
Proposed Care Instruction	:	-
Test Performed	:	Selected test(s) as requested by applicant
Sample Receiving Date	:	Mar 25, 2021
Testing Period	:	Mar 29, 2021 - Apr 23, 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 (Account Executive)

Dongjing Liu / Hailian Xuan (Authorized Signatory)

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Comment

	EN 14605:2005+A1:2009 (Type 3)	EN 14605:2005+A1:2009 (Type 4)	EN 14126:2003/AC:2004
Abrasion Resistance	Class 1	Class 1	**Referring to Type 3/ Type 4comment**
Compression-Folding (Schildknecht) Flex Cracking Resistance	Class 6	Class 6	
Compression-Folding (Schildknecht) Flex Cracking Resistance at -30°C	Class 6	Class 6	
Trapezoidal Tear Resistance	Class 3	Class 3	
Tensile Strength	Class 2	Class 2	
Puncture Resistance	Class 1	Class 1	
Seam Strength	Class 3	Class 3	
Resistance to Permeation by Chemicals for Materials (Fabric :HCL, 38%)	No Classification	No Classification	
Resistance to Permeation by Chemicals for Materials (Taped Straight Seam:HCL, 38%)	Class 1	Class 1	
Whole Suits Testing	Pass	Pass	
Resistance to penetration by contaminated liquids under hydrostactic pressure	/	/	Class 6:20kPa Pass
Resistance to penetration by infective agents due to mechanical contact with substances containing contaminated liquids	/	/	Class 6
Resistance to penetration by contaminated liquid aerosols	/	/	Class 3
Resistance to penetration by contaminated solid particles	/	/	Class 3

Remark: Pass = Meet Relative Standard Requirement
Fail= Below Relative Standard Requirement

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Test Result

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	No. 1	No. 2	No. 3	No. 4	Minimum
The quoted result(Rubs)	21	24	25	26	21

Recommended Class:1
Remark:
1. Visual examination is used for damage assessment after abrasion. If the assessment is performed through visual inspection, the maximum classification that can be claimed is a Class 3.
2. Classification of abrasion resistance: Class 1 >10rubs; Class 2 >40rubs; Class 3 >100rubs; Class 4 >400rubs; Class 5 >1000rubs; Class 6 >2000rubs.

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

Recommended Class: 6
Remark:
1) Visual examination is used for damage assessment after flex cracking. Visual inspection shall not be used for the performance classification of Type 1 through Type 3(EN 943-1, EN 943-2, EN 14605)
2) 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

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Recommended Class: 6
Remark:
1) Visual examination is used for damage assessment after flex cracking. Visual inspection shall not be used for the performance classification of Type 1 through Type 3(EN 943-1, EN 943-2, EN 14605)
2) 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.

Clause 4.7 Trapezoidal Tear Resistance

(EN ISO 9073-4:1997;)

A

As Received	No. 1	No. 2	No. 3	No. 4	No. 5	Minimum
Warp/Length Yarns Torn(N)	60	62	61	59	62	59
Weft/Width Yarns Torn(N)	45	45	49	49	48	45

Recommended Class:3
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

As Received	No. 1	No. 2	No. 3	No. 4	No. 5	Minimum
Warp/Length(N)	89	92	93	95	87	87
Weft/Width(N)	80	79	76	78	73	73

Recommended Class2
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

As Received	No. 1	No. 2	No. 3	No. 4	No. 5	Minimum
Puncture Force(N)	8	8	9	7	8	7

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

	# 1	# 2	# 3	Average
Sleeve seam (N)	120(F.R.)	121(F.R.)	120(F.R.)	120(F.R.)
In-side seam (N)	124(F.R.)	135(F.R.)	138(F.R.)	132(F.R.)
Crotch seam (N)	217(F.R.)	214(F.R.)	209(F.R.)	214(F.R.)
Back rise seam (N)	131(F.R.)	120(F.R.)	127(F.R.)	126(F.R.)
Recommended Class	3			

Notes F.R. = Fabric Rupture;
Remark:
Classification of seam strength: Class 1 >30N; Class 2 >50N; Class 3 >75N; Class 4 >125N; Class 5 >300N; Class 6 >500N.

Protective Clothing against Liquid Chemicals — Performance Requirements for Clothing with Liquid-Tight (Type 3) or Spray-Tight (Type 4) Connections, including Items Providing Protection to Parts of The Body Only (Types PB [3] and PB [4])
(EN 14605:2005+A1:2009)

EN 14325:2004 Clause 4.11 Resistance to Permeation of Liquids & Clause 5.4.2 Resistance of Seams to Permeation of Liquids
(ISO 6529: 2013 Method A)

Sample: A
Challenge chemical: HCL, Concentration:38% ,Physical state: Liquid , CAS No:7664-93-9

Test cell	:	1'' cell used
Collection medium	:	Grade 3 water
Frequency of scan	:	Every 60 seconds
Precondition area	:	Temperature (20±2) ºC, RH(65±5)% for 24 hours
Testing area temperature	:	23+/-1°C
Analytical technique	:	Conductivity
System configuration	:	Closed-loop
Flow rate	:	100ml/min
MDPR (Minimum Detectable Permeation Rate)	:	0.004 μg/(min•cm^2)

As received-Set 1

Test area (Fabric)	Specimen 1 Arm	Specimen 2 Leg	Specimen 3 Body	Average
Unit area weight (g/m2)	97	95	100	97
Sample thickness (mm)	0.38	0.36	0.40	0.38
BDT (min)	<1	<1	<1	<1
Breakthrough time $BT_{1.0}$ (min)	5	3	4	4

Recommended Class: No Classification recommended due to all specimens results of Breakthrough time were below Class1 performance requirement.

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As received-Set 1

Test area (Taped Straight Seam)	Specimen 1 Arm	Specimen 2 Leg	Specimen 3 Body	Average
Unit area weight (g/m2)	N/A	N/A	N/A	N/A
Sample thickness (mm)	N/A	N/A	N/A	N/A
BDT (min)	<1	<1	<1	<1
Breakthrough time $BT_{1.0}$ (min)	20	16	22	19

Recommended Class: Class 1 shall be recommended based on the lowest individual result of Breakthrough time.

Remark：

1.BDT—Breakthrough Detection Time (in minutes), Elapsed time measured from the start of the test to the sampling time that immediately precedes the sampling time at which the test chemical is first detected;
$BT_{1.0}$— Normalized Breakthrough Detection Time (in minutes) at a permeation rate of 1.0 μg/(cm2·min).

2. Pre-screening according to ISO 13994 to determine if the material is resistant to liquid penetration is not performed. Tests performed in triplicates as per materials resistant to liquids.
3. Methods for measuring the thickness and mass can be found in ISO 6529 clause 9.3
4. N/A: Not applicable.
5. Classification of Resistance to permeation by chemicals (Breakthrough time): Class 1>10 min; Class 2>30 min; Class 3>60 min; Class 4>120 min; Class 5>240min; Class 6>480min.

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中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t (86-21) 61402666 f (86-21) 64958763 e sgs.china@sgs.com

Protective Clothing against Liquid Chemicals — Performance Requirements for Clothing with Liquid-Tight (Type 3) or Spray-Tight (Type 4) Connections, including Items Providing Protection to Parts of The Body Only (Types PB [3] and PB [4])
(EN 14605:2005+A1:2009)

Clause 4.3 Performance Requirements for Whole Suits-Type 3

Sample A

	Description
Undergarment:	Nonwovens
Additional equipment:	/

The physical dimensions of the wearers are shown below

Tested Subjects	Total Height(cm)	Chest girth(cm)	Suit size
Lu	175	95	M(175)

Clause 4.3.4.1 General and Preliminary Testing

Prior to testing each suit in accordance with EN ISO 17491-3 or EN ISO 17491-4, a practical test shall be carried out by a human test subject. The test shall comprise three repetitions, at moderate speed, of the "seven 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

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. Repeat movement with alternate posture, i.e.by kneeling on left knee and placing the right foot on the floor with knee bent at 90°;

-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. Repeat movement with alternate posture by alternating arms.

Clause 4.3.4.3 Resistance to Penetration by Liquids (Jet Test)

(EN ISO 17491-3:2008)

Test room temperature:	23.3℃
Test liquid composition:	Methyl blue, sodium lauryl ether sulphate, citric acid and water
Test liquid surface tension:	(30±5)X10^{-3}N/m
Pressure of the liquid supplied:	150kPa

Test sample	Calibrated Stain area (cm^2)	Total stain area on undergarment (cm^2)	Conclusion
1	3.61	0	Pass
2	3.61	0	Pass
3	3.61	0	Pass

Remark: All suits shall pass the test, i.e. the total area on any one undergarment of each suit shall be less than or equal to three times the total calibrated stain area.

Comment: The submitted samples complies with the requirements of EN 14605:2005+A1:2009 Clause 4.3 whole Suits Test for Type 3

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3rd Building,No.889,Yishan Road,Xuhui District Shanghai,China 200233 t (86-21) 61402666 f (86-21) 64958763 www.sgsgroup.com.cn
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Protective Clothing against Liquid Chemicals — Performance Requirements for Clothing with Liquid-Tight (Type 3) or Spray-Tight (Type 4) Connections, including Items Providing Protection to Parts of The Body Only (Types PB [3] and PB [4])
(EN 14605:2005+A1:2009)

Clause 4.3 Performance Requirements for Whole Suits-Type 4

Sample A

	Description		
Undergarment:	Nonwovens		
Additional equipment:	/		
The physical dimensions of the wearers are shown below			
Tested Subjects	Total Height(cm)	Chest girth(cm)	Suit size
Lu	175	95	M(175)

Clause 4.3.4.1 General and Preliminary Testing

Prior to testing each suit in accordance with EN ISO 17491-3 or EN ISO 17491-4, a practical test shall be carried out by a human test subject. The test shall comprise three repetitions, at moderate speed, of the “seven 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

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. Repeat movement with alternate posture, i.e.by kneeling on left knee and placing the right foot on the floor with knee bent at 90°;

-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. Repeat movement

with alternate posture by alternating arms.

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Clause 4.3.4.2 Resistance to Penetration by Liquids (Spray Test)

(EN ISO 17491-4:2008 Method B: high-level spray test)

Test room temperature:	23.1℃
Test liquid composition:	Methyl blue, sodium lauryl ether sulphate, citric acid and water
Test liquid surface tension:	(30±5)X10^{-3}N/m
Pressure of the liquid supplied:	300kPa

Test sample	Calibrated Stain area (cm^2)	Total stain area on undergarment (cm^2)	Conclusion
1	3.61	0	Pass
2	3.61	0	Pass
3	3.61	0	Pass

Remark: All suits shall pass the test, i.e. the total area on any one undergarment of each suit shall be less than or equal to three times the total calibrated stain area.

Comment: The submitted sample complies with the requirements of EN 14605:2005+A1:2009 Clause 4.3 whole Suits Test for Type 4

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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 4.1.4.1 Resistance to Penetration by Contaminated Liquids under Hydrostatic Pressure
(ISO 16603:2004, Procedure D)

Specimen	1#	2#	3#	Ave.
Thickness(mm)	0.363	0.372	0.369	0.36
Weight (g/m^2)	95.459	95.067	96.044	100

Observation on viewing side	1#	2#	3#
Procedure D			
0 kPa for 5 min	Pass	Pass	Pass
1.75 kPa for 5 min	Pass	Pass	Pass
3.5 kPa for 5 min	Pass	Pass	Pass
7 kPa for 5 min	Pass	Pass	Pass
14 kPa for 5 min	Pass	Pass	Pass
20 kPa for 5 min.	Pass	Pass	Pass

Remark :
1) Pass- No penetration on viewing side, Fail- Penetration on viewing side;
2) The synthetic blood test(ISO 16603) is used for screening purposes for bacteriophage test(ISO 16604), and the material shall be classified according to the result obained in bacteriophage test(ISO 16604).

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Clause 4.1.4.1 Resistance to penetration by contaminated liquids under hydrostactic 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： 1.4

Starting bacteriophage challenge titer (PFU/ml)： 4.1×10^{8}

Ending bacteriophage challenge titer (PFU/ml)： 2.1×10^{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 plagues.
TNTC= PFUs were too numerous to count.

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3rd Building,No.889,Yishan Road,Xuhui District Shanghai,China 200233 t (86-21) 61402666 f (86-21) 64958763 www.sgsgroup.com.cn
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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): 20210312

Test condition: Temperature: 21.3℃ Humidity: 47.2%

Distance between agar surface to plate rim: 3.03 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 $1.3*10^4$ 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	77	95	162	81	77
Recommended Class	6				

According to EN 14126:2003/AC:2004：

Classification	Breakthrough time, t (min)	Class 6: t >75min; Class 5: 60<t≤75min; Class 4: 45<t≤60min; Class 3: 30<t≤45min; Class 2: 15<t≤30min; Class 1: t ≤15min;

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:6.5×10^7CFU/ml

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

Side in contact with the aerosol: Out side

Pretreatment: None

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

laboratory test conditions : Temperature : 20.2℃; Relative humidity :54.5%

Teat Rusult

Specimen	Control（CFU）	Specimen（CFU）	Colonies Ratio	Penetration ratio (log)
1	3.5×10^5	<1	3.5×10^5	>5
2	2.9×10^5	<1	2.9×10^5	>5
3	3.2×10^5	<1	3.2×10^5	>5
4	2.2×10^5	<1	2.2×10^5	>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≤5
1	1＜log≤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:4.4×10^8 CFU/g talcum powder,Sample:12,Vibration frequency: 20800 times/min, Vibration time:30min）

Material

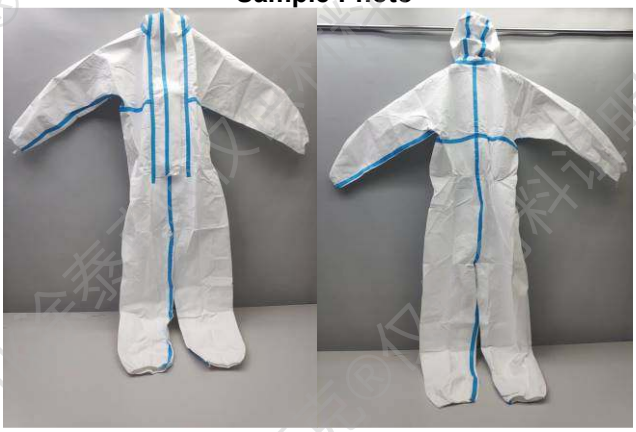
Sample	Measured value (CFU)	Classification
1	0	3
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	
The median（Md）	0	
The upper quartile (Uq)	0	
Penetration (log cfu)	<1	

Classification of EN 14126:

Class	Penetration (log cfu)
3	**≤1**
2	1 < log cfu ≤ 2
1	2 < log cfu ≤ 3

3rd Building,No.889,Yishan Road,Xuhui District Shanghai,China 200233 t (86-21) 61402666 f (86-21) 64958763 www.sgsgroup.com.cn
中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t (86-21) 61402666 f (86-21) 64958763 e sgs.china@sgs.com

Sample Photo



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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