



Act without fear!



DEREKDUCK
www.dereckduck.com

DEREKDUCK INDUSTRIES CORP.

9F, No.70-1, Sec. 1, Chengde Rd., Taipei 10351, Taiwan

TEL: +886 2 2550 8856

EMAIL: dereckduck@dereckduck.com

ultitec-protection.com

10
YEARS

ULTITEC



*Chemical Protective Clothing
Product Catalogue*



DEREKDUCK INDUSTRIES CORP.

DEREKDUCK established in 1992, has been devoting to innovation, R&D, and creation of appropriate body protection. We offer body protection solutions applicable to both medical and industrial fields, which includes chemical protective clothing and infection control gowns. Corporate slogan is "You are safe with us!", as we assured frontline operators to work safely even though exposed to hazardous situations in workplace. As a manufacturer with decades of experience in nonwoven materials, DEREKDUCK is known with Professional Service, Technical Support and High Quality Products, which gained recognition worldwide in over 40 countries.

ASSURED QUALITY MANUFACTURING

With nearly 30 years experience in nonwoven industry, our quality assurance system is inspected and certified by SGS and fully meets the requirement of Regulation (EU) 2016/425 (Module D). ULTITEC, manufactured under the rigorous quality standard, strictly follows the European Norm specified in Category III of the regulation for chemical protective clothing. DEREKDUCK is also an ISO 9001:2015 certified company and a registered supplier for the US FDA.



Module D

ISO 9001:2015

TAILORED-MADE PROCESS

DEREKDUCK has been devoting itself to protective clothing manufacturing for nearly 30 years. We found that standard protective clothing can protect wearers against hazards but it may not be friendly or convenient enough for some specific frontline workers. In order to enrich users' wearing experience, we offer tailor-made service to different industries for the benefit of users' comfort and working efficiency.

Tailored-made process:



1. Concept

Review users' painful points while determine their requirements of application, environmental hazards and required protection level.

2. Prototype

Make prototype sample after concept is confirmed.

3. Validation

Allow users proceed field test on the prototype and evaluate if sample improvement is required based on users' feedback.

4. Quotation

Provide quotation after the prototype is confirmed.

5. Mass Production

Conduct mass production and provide training materials upon request.

6. Tracking

Follow up feedback and upgrade design for better users' experience if necessary.

Act without fear!

DEREKDUCK launched own protective clothing brand ULTITEC in 2008 with brand slogan "Act without fear!". This is to commend frontline heroes as they are the ones dealing with toxic dust or liquid hazards, ULTITEC can be their ultimate safety shield when working. ULTITEC is made of two words "ULTIMATE" and "PROTECTION", as our intention is to make sure frontline operators get appropriate protection even though exposed to dangerous environment and go home safely after mission completed.

ULTITEC in International Rescue Events

• 2013 Rayong oil spill in the Gulf of Thailand

About 50,000 liters of oil spilled which caused oil slick floating on the sea and reaching the Gulf of Thailand. Thousands of workers kept cleaning the contaminated beach to reduce the terrible damage from this devastating disaster. ULTITEC 3000T provided the necessary protection against any possible damage to those personnel involved.



Image Souce: Nicolas Axelrod



Image Souce: Nicolas Axelrod

• 2017 Turkey gas plant asbestos removal operation

Turkey local online press revealed that around 15% to 40% of the asbestos was measured from a gas plant demolishment in Ankara and was detected as amphibole which is the most danger of asbestos strain. ULTITEC 1000L and ULTITEC 2000 were used for their physical protection.

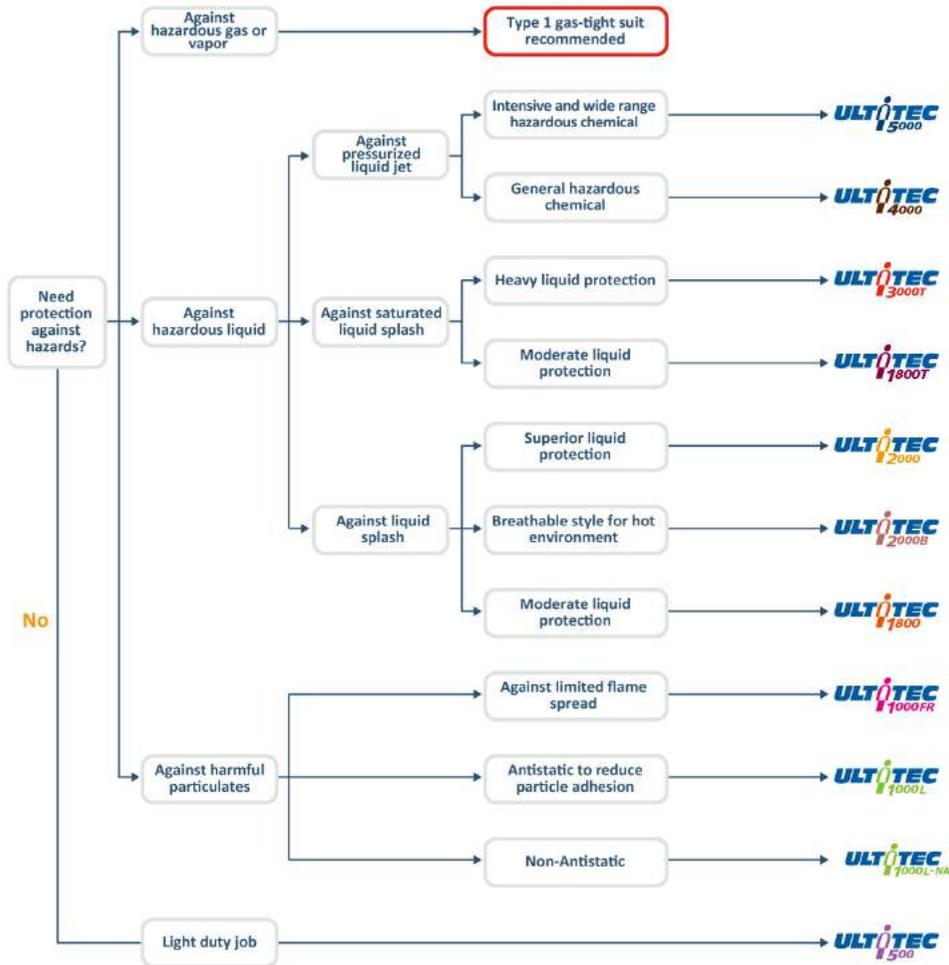


• 2019 Taiwan Bird Flu culling operation

In recent years, the bird flu had caused serious economic losses in many countries, including Taiwan, Southeast Asia and China. In this incident, the frontline operators handling the culling work were using ULTITEC 2000 to protect themselves in workplace from the threat of contamination.



SELECTION CHART BY RISK



CE STANDARDS FOR PROTECTIVE CLOTHING

Protective clothing is designed to resist various hazardous situations. Regulation (EU) 2016/425 indicates the categories of risk against which PPE is intended to protect users.

Chemical protective clothing complies with Category III, which includes exclusively the risks that may cause very serious consequences such as death or irreversible damage to health. And the requested certification enumerate on the following explanation.

TYPE 1	TYPE 1 EN 943-1 Gas tight suits Protective clothing against dangerous solid, liquid and gaseous chemicals, including liquid and solid aerosols.	TYPE 3	TYPE 3 EN 14605 Liquid tight suits Suits which can protect against strong and directional jets of a liquid chemical such as spray from a burst pipe under pressure. Requires a barrier fabric and sealed seams.
TYPE 4	TYPE 4 EN 14605 Spray tight suits Suits which can protect against saturation of liquid chemical, where the volume of the liquid builds up on the suit forming pools, resulting in rivulets. Requires a barrier fabric and sealed seam.	TYPE 5	TYPE 5 EN ISO 13982-1 Dry particle suits Suits for protection against hazardous dry particles.
TYPE 6	TYPE 6 EN 13034 Reduced spray suits Suits for protection against light spray and splashes of liquid chemicals where there is no directional spray or build up of liquid on the suit, but there may be a fine mist of droplets in the atmosphere.	EN 1073-2	AGAINST RADIOACTIVE CONTAMINATION EN 1073-2 Protective clothing against particulate radioactive contamination.
EN 1149-5	ANTI-STATIC EN 1149-5 Protection against static electricity or charge decay.	EN 14126	AGAINST BIOLOGICAL HAZARDS EN 14126 Protection against biological hazards and infective agents.
EN ISO 14116 Index 1/0/0	AGAINST LIMITED FLAME SPREAD PROTECTION EN ISO 14116 Limited flame spread materials, material assemblies, and clothing.	DIN 32781	AGAINST PESTICIDES DIN 32781 Suits for protection against pesticides.



TEST METHOD

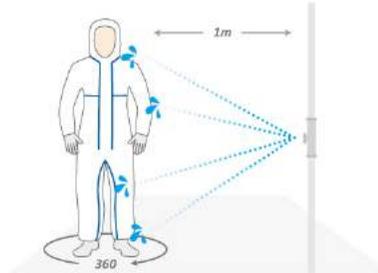


TYPE 3

TYPE 3 EN 14605 Liquid Jet Suits

Determination of resistance to penetration by a jet of liquid

- Fabric, seams and joints being tested with intense and pressurized liquid jet
- Low surface tension of liquid jet
- Requires coveralls with fully sealed seam
- One nozzle sprays at potential weak areas of coverall including chinstrap, crotch, zipper flap and joints

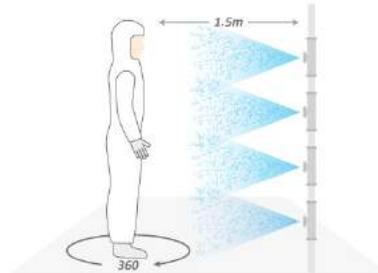


TYPE 4

TYPE 4 EN 14605 Spray Tight Suits

Determination of resistance to penetration by liquid spray

- 4 nozzles with general overspray of liquid without penetration on coverall
- Low surface tension of liquid sprays being tested on whole garment to experiment saturation of fabric
- Fabric, seams and joints being tested without pressurized liquid spray



TYPE 5

TYPE 5 EN ISO 13982-1 Particulate Tight Suits

Determination of inward leakage of aerosols & solid particles

- Spray cabin filled with particles
- The test is performed by real person, aims to simulate daily use
- Subject (real person) performs 3 exercises on treadmill
- Particle inward leakage(IL) and total inward leakage(TIL) must meet test requirements

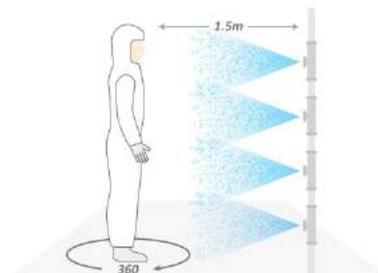


TYPE 6

TYPE 6 EN 13034 Reduced Spray Suits

Determination of resistance to penetration by reduced liquid spray

- 4 nozzles with general overspray of liquid without penetration on coverall
- Low surface tension of liquid sprays being tested on whole garment to experiment saturation of fabric
- Fabric, seams and joints being tested without pressurized liquid spray
- About 40% of the liquid spray is loaded onto the suit compared with Type 4 test



TEST METHOD



EN 1073-2

EN 1073-2 Against Radioactive Contamination

Determination of inward leakage of aerosols & solid particles

- The standard was developed to be applied in nuclear industry with no protection against ionizing radiation
- The test follows the same protocols as Type 5 test with different judgement criteria
- 3 classifications indicate different protection level



EN 14116

EN ISO 14116 Flame Retardant Test

- To check whether the fabric/materials burn while contacting heat resource
- To check whether the fabric stops flame spreading if burned
- Requirements for limited flame spread Index 1 including no spreading of the flame, no flaming debris, no afterglow, a hole may be formed



EN 14126

EN 14126 Against Biological Hazards

- The standard specifies a set of requirements and test methods to measure the fabric protection against infective agents
- ISO 16603, ISO 16604, ISO/DIS 22611 determines penetration by blood, body fluids, blood borne and biologically contaminated aerosol
- ISO 22612, ISO 22610 determines the resistance of dry and wet microbial penetration



EN 1149-5

EN 1149-5 Antistatic

- The standard specifies a set of requirements and test methods to measure the fabric protection against static electricity or charge decay
- Electrostatic resistance is required when the worker is exposed to environments where sparks could cause explosions or ignition
- Coveralls according to this standard do not offer protection from main voltages



DIN 32781

DIN 32781 Against Pesticides

- The test standard covers requirements in chemical penetration, fabric strength and ergonomics.
- The certification includes EN 14786, which simulates liquid spray of drugs
- Five different pesticides including U46-D-Fluid (BASF), Pirimor Granulat (Syngenta), Amistar, (Syngenta), Betanal Expert (Bayer), Follicur (Bayer) are tested to ensure protection against pesticides

	ULTIMATEC 500	ULTIMATEC 1000L	ULTIMATEC 1000L-NA	ULTIMATEC 1000FR	ULTIMATEC 1800	ULTIMATEC 1800T	ULTIMATEC 2000	ULTIMATEC 2000B	ULTIMATEC 3000T	ULTIMATEC 4000	ULTIMATEC 5000
	Light Protection Protective Clothing	Dust & Liquid Spray Protective Clothing	Dust & Liquid Spray Protective Clothing <i>*None-Antistatic</i>	Dust, Liquid Spray & Flame Retardant Protective Clothing	Oil & Liquid Splash Resistant Protective Clothing	Oil & Saturated Splash Resistant Protective Clothing	Premium Oil, Liquid Splash & Infection Agents Resistant Protective Clothing	Comfortable Liquid Splash Resistant Protective Clothing	Premium Oil, Saturated Liquid Splash & Pesticide Resistant Protective Clothing	Chemical & Liquid Jet Resistant Protective Clothing	High-level Chemical & Liquid Jet Resistant Protective Clothing
	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★	Breathability ★★★★★
	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★	Liquid Protection ★★★★★
	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★	Particulate Protection ★★★★★
Category I	 EN 1149-5	 EN 1149-5	 EN 1149-5	 EN 1073-2, EN 1149-5	 EN 1073-2, EN 1149-5	 EN 1149-5	 EN 1073-2, EN 1149-5, EN 14126	 EN 1149-5	 EN 1149-5, EN 1073-2, EN 14126	 EN 1149-5, EN 1073-2, EN 14126	 EN 1149-5, EN 1073-2, EN 14126

Outstanding

★★★★★

Superior

★★★★☆

Great

★★★☆☆

Fine

★★☆☆☆

Minimal

★☆☆☆☆

ULTITEC 500

ULTITEC 500
Light Protection
Protective Clothing

Breathability



Liquid Protection



Particulate Protection



FEATURES

- Strong and durable fabric offers light protection for non-toxic environment
- Designed to fit your body shape
- CE Category I protective clothing

APPLICATION

Civil Protection, Decorative Work,
Construction, Food Processing & Packing

PACKAGING

1pc / bag
50pcs / carton



Zipper fastens to
underside of chin



3-piece hood



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



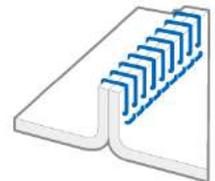
Color



Seam Construction

4-thread overlapped seam

- 7-9 stitched per inch
- Thread fibre is 150D
- Bite depth 4 mm



ULTITEC

*Particulate
Protection*



MOVE EASILY, WORK EFFICIENTLY

ULTITEC
1000L

ULTITEC
1000L-NA

ULTITEC
1000FR



ULTITEC 1000L Dust & Liquid Spray Protective Clothing

NA : None-Antistatic

Designed to protect against harmful particulates and light liquid spray in workplace with highly breathable comfortness.

ULTITEC 1000L



TYPE 5 TYPE 6 EN 1073-2 EN 1149-5

ULTITEC 1000L-NA



TYPE 5 TYPE 6 EN 1073-2

Breathability



Liquid Protection



Particulate Protection



FEATURES

- **Superior barrier against harmful particulates**
The fabric filters resist 99.8% of particles of size 0.5-1µm.
- **Increased durability but maintaining lightweight**
Our multi-layer SMS fabric provides physical-durable performance but remains lightweight for wearer's comfort.
- **Designed to fit your body shape**
Fully elasticated hood, ankles, wrists, and waist provides optimum comfort and ease of movement.
- **Antistatic (EN 1149-5) is optional**
If antistatic is not required, then ULTITEC 1000L-NA can be an option. It provides a more cost-effective solution and is especially suitable for asbestos removal.

APPLICATION

Asbestos
Construction
Grinding
Hazardous Dust
Metal Polishing
Mining Process
Powder Coating
Waste Cleaning
Sand blasting

PACKAGING

1pc / bag
50pcs / carton



Zipper fastens to underside of chin



3-piece hood



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



PERFORMANCE CHART

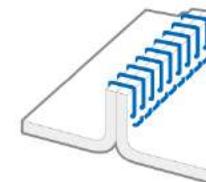
FABRIC PHYSICAL PROPERTIES	TEST METHOD	ULTITEC 1000L CLASS	ULTITEC 1000L-NA CLASS
Abrasion Resistance	EN 530	1	1
Flex Cracking Resistance	EN ISO 7854/8	5	4
Trapezoidal Tear Resist.	EN ISO 9073-4	3	3
Tensile Strength	EN ISO 13934-1	1	2
Puncture Resistance	EN 863	1	1
Seam Strength	EN ISO 13935-2	3	2
Antistaticity	EN 1149-5	Pass	-
pH Value	EN ISO 3071	Pass	Pass
AZO Colourants	EN 14362-1	Pass	Pass
Colour Fastness to Perspiration	EN ISO 105-E04	Pass	Pass
Resistance to Ignition	EN 13274-4	Pass	Pass

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN ISO 6530	Class 3	Class 3	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 3	Class 3	Class 3	Class 3

WHOLE SUIT TEST PERFORMANCE		RESULT	RESULT
Type 5	Inward Leakage Test	Pass	Pass
Type 6	Low Level Spray Test	Pass	Pass
EN 1073-2	Protective Clothing Against Radioactive Contamination	Class 1	Class 1

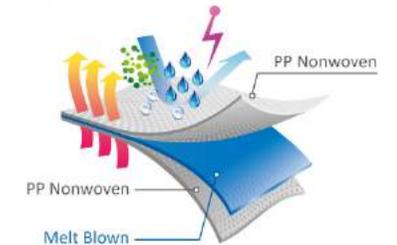
Seam Construction

- 4-thread overlapped seam
- 7-9 stitched per inch
- Thread fibre is 150D
- Bite depth 4 mm



Fabric Construction

Multilayer SMS fabric





ULTITEC 1000FR Dust, Liquid Spray & Flame Retardant Protective Clothing

Designed to protect you
and your reusable flame
resistant suits from limit
flame spread and
chemicals.



TYPE 5



TYPE 6



EN ISO 14116
Index 1/0/0



EN 1073-2



EN 1149-5

Breathability



Liquid Protection



Particulate Protection



FEATURES

- **Prolong shelf life of high-priced flame resistant garments**
Worn on top of your flame-resistant garments to prolong their usage duration and minimize laundry costs.
- **Proven protection for limited flame spread and liquid spray**
ULTITEC 1000FR is certified for protection against harmful particulates, light liquid spray and it offers limited flame spread protection which meets EN ISO 14116 Index 1.

Notes:

According to EN ISO 14116 Index 1, the limited flame spread protective clothing must never be in direct contact with skin. ULTITEC 1000FR must be always worn on top of Index 2 or 3 thermal protective garments and hoods.



APPLICATION

Gas & Oil
Metal Welding
Petrochemical
Railway
Utilities

PACKAGING

1pc / bag
50pcs / carton

Zipper fastens to underside of chin



3-piece hood



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	1
Flex Cracking Resistance	EN ISO 7854/B	4
Trapezoidal Tear Resist.	EN ISO 9073-4	2
Tensile Strength	EN ISO 13934-1	1
Puncture Resistance	EN 863	2
Seam Strength	EN ISO 13935-2	3
Antistaticity	EN 1149-5	Pass
pH Value	EN ISO 3071	Pass
Colour Fastness to Perspiration	EN ISO 105-E04	Pass
Resistance to Ignition	EN 13274-4	Pass
AZO Colourants	EN 14362-1	Pass
Limited Flame Spread	EN ISO 14116	Index 1/0/0

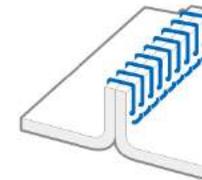
FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 2	Class 3

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 5 Inward Leakage Test	Pass
Type 6 Low Level Spray Test	Pass
EN 1073-2 Protective Clothing Against Radioactive Contamination	Class 1

Seam Construction

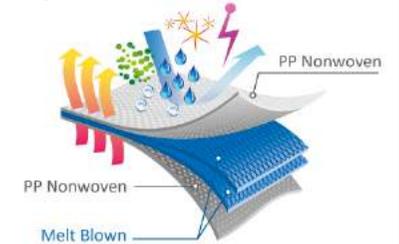
4-thread overlapped seam

- 7-9 stitched per inch
- Thread fibre is 150D
- Bite depth 4 mm



Fabric Construction

Multilayer SMMS fabric



ULTIMATEC

*Liquid
Protection*

PERSIST WITH ULTIMATE PROTECTION

ULTIMATEC 1800 **ULTIMATEC** 1800T **ULTIMATEC** 2000 **ULTIMATEC** 2000B **ULTIMATEC** 3000T



ULTITEC 1800 Oil & Liquid Splash Resistant Protective Clothing

Designed as a barrier to liquid splash. It offers good liquid protection and breathability in general industry.



TYPE 5-B



TYPE 6-B



EN 14126



EN 1073-2



EN 1149-5

Breathability



Liquid Protection



Particulate Protection



FEATURES

- **Proven protection of fabric performance against industrial chemicals**
Act as a barrier against liquid penetration and repellency which meets EN 6530 standard.
- **Breathable & comfortable**
High water-vapour transmission rate results in good breathability and soft texture ensures wearer's comfort.
- **Low linting**
Reduces risk of fibre contamination in workplace.

APPLICATION

Agriculture
Automotive
Biological Hazards
Cleaning Process
Construction
Chemical Plants
Petrochemical
Pharmaceutical
General Manufacturing
Wind Energy
Painting

PACKAGING

1pc / bag
50pcs / carton



Zipper fastens to underside of chin



3-piece hood



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	1
Flex Cracking Resistance	EN ISO 7854/B	3
Trapezoidal Tear Resist.	EN ISO 9073-4	2
Tensile Strength	EN ISO 13934-1	1
Puncture Resistance	EN 863	1
Seam Strength	EN ISO 13935-2	4
Antistaticity	EN 1149-5	Pass
pH Value	BS 3266	Pass
Resistance to Ignition	EN 13274-4	Pass
Water Vapour Resistance[Ret]	EN ISO 11092	9.3 m ² *Pa/W

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN 6530	Class 3	Class 3

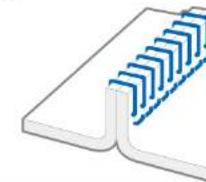
AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	1
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 5 Inward Leakage Test	Pass
Type 6 Low Level Spray Test	Pass
EN 1073-2 Protective Clothing Against Radioactive Contamination	Class 1

Seam Construction

4-thread overlapped seam

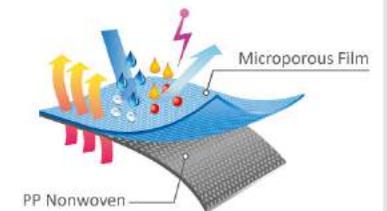
- 7-9 stitched per inch
- Thread fibre is 150D
- Bite depth 4 mm



Fabric Construction

Microporous film laminate PPSB

- Ret value at 9.3m²*Pa/W





Designed as a barrier to saturated liquid. It offers good protection and breathability with Type 4 certification.



TYPE 4-B



TYPE 5-B



TYPE 6-B



EN 1073-2



EN 1149-5



EN 14126

APPLICATION

Agriculture, Automotive, Biological Hazards, Chemical Plants, Disaster Management, Petrochemical, Pharmaceutical, Painting

PACKAGING

1pc / bag
50pcs / carton

FEATURES

- **Proven protection of fabric performance against industrial chemicals**
Act as a barrier against liquid penetration and repellency which meets EN 6530 standard.
- **Breathable & Comfortable**
High water-vapour transmission rate results in good breathability and soft texture ensures wearer's comfort.
- **Sealed seam offers premium protection**
Liquid-proof tape on seam to ensure wearer being protected with no seepage.



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	1
Flex Cracking Resistance	EN ISO 7854/B	3
Trapezoidal Tear Resist.	EN ISO 9073-4	2
Tensile Strength	EN ISO 13934-1	1
Puncture Resistance	EN 863	1
Seam Strength	EN ISO 13935-2	3
Antistaticity	EN 1149-5	Pass
pH Value	EN ISO 3071	Pass
Resistance to Ignition	EN 13274-4	Pass
Water Vapour resistance[Ret]	EN ISO 11092	9.3m ² *Pa/W

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN 6530	Class 3	Class 3

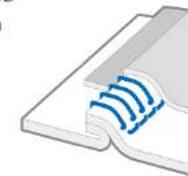
AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	1
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 4 Spray Test	Pass
Type 5 Inward Leakage Test	Pass
Type 6 Low Level Spray Test	Pass
EN 1073-2 Protective Clothing Against Radioactive Contamination	Class 3

Seam Construction

4-thread overlapped seam with liquid-proof tape

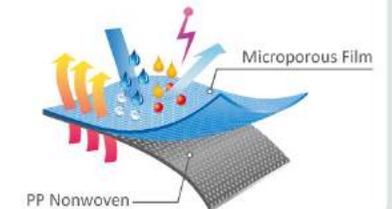
- 7-9 stitches per inch
- Thread fibre is 150D
- Bite depth at 4mm



Fabric Construction

Microporous film laminate PPSB

- Ret value at 9.3m²*Pa/W





ULTITEC 2000
Premium Oil, Liquid
Splash & Infective
Agents Resistant
Protective Clothing

Designed to protect wearers against heavy liquid splash and biological hazards. The most popular and widely applied choice in various industries.



Breathability



Liquid Protection



Particulate Protection



FEATURES

- **An effective barrier against blood, body-fluid and infective agents.**
The fabric performance exceeds both WHO protective clothing specification option 1 & 2 for Ebola infection control. [Note*]
- **Proven protection against pesticides**
Meets DIN 32781 requirement on pesticide penetration and comfort for agriculture application.
- **Breathable to work efficiently**
Designed for comfort use. Allow wearers to work efficiently while releasing their body heat to prevent heat exhaustion.
- **Low linting**
Reduces risk of fibre contamination in workplace.
- **Targeted for ISO Class 6 and above cleanroom environment with controlled variables [Note**]**

Note*: The WHO recommended specification for coveralls against filovirus disease issued in Oct, 2014 stated that healthcare workers should choose appropriate protective apparel, which meets the following two requirements:
Option 1, tested for resistance to blood and body fluid penetration: meets or exceeds ISO 16603 Class 3 exposure pressure.
Option 2, tested for resistance to blood-borne pathogen penetration; meets or exceeds ISO 16604 Class 2 exposure pressure.

Note**: ULTITEC 2000 is suitable for both ISO 14644-1 and US FED-STD 209E cleanroom standard. Test result shown in the following table:

ISO 14644-1 Class	1	2	3	4	5	6	7	8	9
US FED-STD 209E	—	—	1	10	100	1,000	10,000	100,000	—
						✓	✓	✓	✓

APPLICATION

- Agriculture
- Automotive
- Biological Hazards
- Disaster Management
- Disease Control
- Electronic Industries
- Pharmaceutical
- Petrochemical

PACKAGING

- 1pc / bag
- 50pcs / carton



Zipper fasten to underside of chin



3-piece hood



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	1
Flex Cracking Resistance	EN ISO 7854/8	5
Trapezoidal Tear Resist.	EN ISO 9073-4	1
Tensile Strength	EN ISO 13934-1	1
Puncture Resistance	EN 863	1
Seam Strength	EN ISO 13935-2	3
Antistaticity	EN 1149-5	Pass
pH Value	EN ISO 3071	Pass
Resistance to Ignition	EN 13274-4	Pass
Resistance to Water Penetration	EN 20811	> 2500 mm H ₂ O
Water Vapour Resistance [Ret]	EN ISO 11092	31.7 m ² *Pa/W

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 3	Class 3
o-Xylene	EN ISO 6530	Class 2	Class 1
Butan-1-ol	EN ISO 6530	Class 3	Class 2
Isopropanol*	EN ISO 6530	0.00%	92.40%

Note* Isopropanol test is not requested under EN 14325, therefore there is no classification

AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	2
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

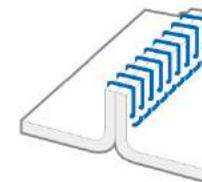
RESISTANCE TO PENETRATION BY PESTICIDES ACCORDING TO EN 14786	Sample 1	Sample 2	Sample 3	Sample 4
Betanal Expert	N.D	N.D	N.D	N.D
Follicur	N.D	0.22%	N.D	N.D
Amistar	N.D	N.D	N.D	N.D
Pinimor Granulat	N.D	N.D	N.D	N.D
U46-D-Fluid	N.D	N.D	N.D	N.D

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 5 Inward Leakage Test	Pass
Type 6 Low Level Spray Test	Pass
EN 1073-2 Protective Clothing Against Radioactive Contamination	Class 1

Seam Construction

4-thread overlapped seam

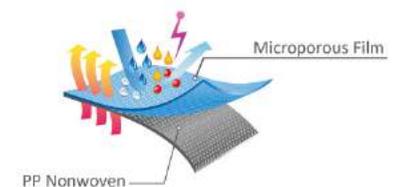
- 7-9 stitches per inch
- Thread fibre is 150D
- Bite depth at 4mm



Fabric Construction

Microporous film laminate PPSB

- MVTR is above 2500 gsm / 24hr (ASTM E96 BW)
- Hydro-head is above 2500 mm-H₂O (EN 20811)



DD302 Sleeve Cover



- Elasticated openings at both ends (bicep and wrist)
- Neoprene rubber (latex free)

DD306 Shoulder Hood



- Elasticated face opening
- Neoprene rubber (latex free)

DD304 Shoe Cover / DD304S Shoe Cover with Sole



- Elasticated opening up to ankle
- Anti-slip PVC sole design is optional
- Neoprene rubber (latex free)

DD305 Boot Cover / DD305S Boot Cover with Sole



- Elasticated opening at ankle and up to calf
- Anti-slip PVC sole design is optional
- Neoprene rubber (latex free)
- DD305T Boot cover with tie / DD305ST Boot cover with sole & tie is optional

DD307 Jacket



- Laydown collar with elasticated wrists
- Front zipper closure for easy donning and doffing
- DD307H Hooded jacket is optional

DD308 Pants



- Elasticated waist to fit body size
- Sufficient crotch area for easy movement

DD309 Sleeve Gown



- Enhanced frontal protection
- Adjustable ties at waist

DD301 Lab Coat



- Laydown collar
- Front zipper closure for easy donning and doffing
- Neoprene rubber (latex free)

DD303 Apron



- Enhanced frontal protection
- Neck loop
- Adjustable ties at waist

PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	1
Flex Cracking Resistance	EN ISO 7854/B	5
Trapezoidal Tear Resist.	EN ISO 9073-4	1
Tensile Strength	EN ISO 13934-1	1
Puncture Resistance	EN 863	1
Seam Strength	EN ISO 13935-2	3
Antistaticity	EN 1149-5	Pass
pH Value	ISO 3071	Pass
Resistance to Ignition	EN 13274-4	Pass
Resistance to Water Penetration	EN 20811	> 2500 mm H ₂ O
Water Vapour Resistance [Ret]	EN ISO 11092	31.7 m ² *Pa/W

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 3	Class 3
o-Xylene	EN ISO 6530	Class 2	Class 1
Butan-1-ol	EN ISO 6530	Class 3	Class 2

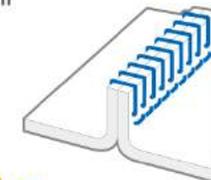
Isopropanol* EN ISO 6530 0.00% 92.40%
 Note* Isopropanol test is not requested under EN 14325, therefore there is no classification

AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	2
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

Seam Construction

4-thread overlapped seam

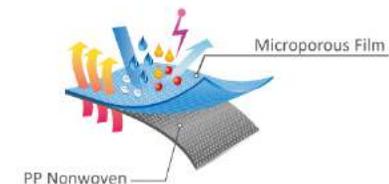
- 7-9 stitches per inch
- Thread fibre is 150D
- Bite depth at 4mm



Fabric Construction

Microporous film laminate PPSB

- MVTR is above 2500 gsm / 24hr (ASTM E96 BW)
- Hydro-head is above 2500 mm-H₂O (EN 20811)





ULTITEC 2000B Comfortable Liquid Splash Resistant Protective Clothing

Designed for hot environment, bringing high breathability through its breathable back panel. It offers exceptional comfort while keeping superior protection in front area.



TYPE 5



TYPE 6



EN 1073-2



EN 1149-5

Breathability



Liquid Protection



Particulate Protection



FEATURES

- **Designed for workplace where main liquid risks come towards the front of wearer**
Front fabric made of ULTITEC 2000 fabrics serves as main protection panel while Back fabric made of ULTITEC 1000L fabric offers breathability.
- **Prevents occupational heat exposure in workplace**
The combination of microporous fabric, SMS fabric and ergonomic design improve airflow in releasing body heat, thus reduce the risk of heat stress.

APPLICATION

- Agriculture
- Automotive
- Cleaning Process
- Construction
- Electronic Industry
- Food Industry
- Petrochemical
- Pharmaceutical
- Painting
- Steel Factory

PACKAGING

- 1pc / bag
- 50pcs / carton

Zipper fastens to underside of chin



Breathable back panel from hood to crotch



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS (Front)	CLASS (Back)
Abrasion Resistance	EN 530	1	1
Flex Cracking Resistance	EN ISO 7854/B	5	5
Trapezoidal Tear Resist.	EN ISO 9073-4	1	3
Tensile Strength	EN ISO 13934-1	1	1
Puncture Resistance	EN 863	1	1
Seam Strength	EN ISO 13935-2	3	3
Antistaticity	EN1149-5	Pass	Pass
pH Value	EN ISO 3071	Pass	Pass
Resistance to Ignition	EN 13274-4	Pass	Pass

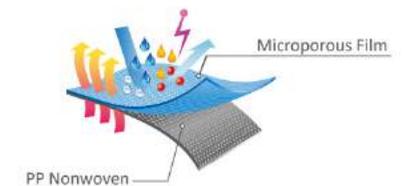
FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION REPELLENCY		PENETRATION REPELLENCY	
Sulphuric Acid 30%	EN ISO 6530	Class 3	Class 3	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 3	Class 3	Class 3	Class 3

WHOLE SUIT TEST PERFORMANCE			RESULT
Type 5	Inward Leakage Test		Pass
Type 6	Low Level Spray Test		Pass
EN 1073-2	Protective Clothing Against Radioactive Contamination		Class 1

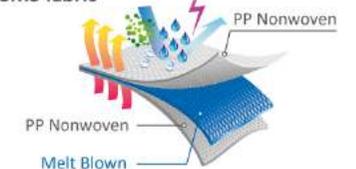
Fabric Construction

Front Fabric
Microporous film laminate PPSB

- MVTR is above 2500 gsm / 24hr (ASTM E96 BW)
- Hydro-head is above 2500 mm-H₂O (EN 20811)



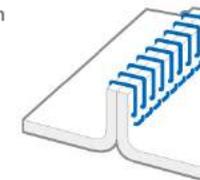
Back Fabric
Multilayer SMS fabric



Seam Construction

4-thread overlapped seam

- 7-9 stitches per inch
- Thread fibre is 150D
- Bite depth at 4mm





ULTITEC 3000T
Premium Oil, Saturated
Liquid Splash & Pesticide
Resistant Protective
Clothing

Designed as an effective barrier to saturated liquid splash. It combines liquid-proof fabric with sealed tape seam while keeping breathable with Type 4 certification.



TYPE 4-B



TYPE 5-B



TYPE 6-B



EN 1149-5



EN 1073-2



EN 14126



DIN 32781

Breathability



Liquid Protection



Particulate Protection



FEATURES

- **An effective barrier against blood, body-fluid and infective agents**
The fabric performance exceeds both WHO protective clothing specification option 1 & 2 for Ebola infection control. [Note*]
- **Proven protection against pesticides**
Meets DIN 32781 requirement on pesticide penetration and comfort for agriculture application.
- **Breathable to work efficiently**
Designed for comfort use. Allow wearers to work efficiently while releasing their body heat to prevent heat exhaustion.
- **Low linting**
Reduces risk of fibre contamination in workplace.
- **Sealed seam offers premium protection**
Liquid-proof tape on seam to ensure wearer being protected with no seepage.

Note*: The WHO recommended specification for coveralls against filovirus disease issued in Oct, 2014 stated that healthcare workers should choose appropriate protective apparel, which meets the following two requirements:
Option 1, tested for resistance to blood and body fluid penetration: meets or exceeds ISO 16603 Class 3 exposure pressure,
Option 2, tested for resistance to blood-borne pathogen penetration; meets or exceeds ISO 16604 Class 2 exposure pressure.

APPLICATION

Agriculture
Automotive
Biological Hazards
Chemical Plants
Disaster Management
Petrochemical
Pharmaceutical

PACKAGING

1pc / bag
50pcs / carton

Zipper fastens to
underside of chin



3-piece hood



Storm flap with adhesive tape



Elasticated wrists



Fully elasticated waist



Ample crotch



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	1
Flex Cracking Resistance	EN ISO 7854/B	5
Trapezoidal Tear Resist.	EN ISO 9073-4	1
Tensile Strength	EN ISO 13934-1	1
Puncture Resistance	EN 863	1
Seam Strength	EN ISO 13935-2	4
Antistaticity	EN 1149-5	Pass
pH Value	EN ISO 3071	Pass
Resistance to Ignition	EN 13274-4	Pass
Resistance to Water Penetration	EN 20811	> 2500 mm H ₂ O
Water Vapour Resistance [Ret]	EN ISO 11092	31.7 m ² Pa/W

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 3	Class 3
o-Xylene	EN ISO 6530	Class 2	Class 1
Butan-1-ol	EN ISO 6530	Class 3	Class 2
Isopropanol*	EN ISO 6530	0.00%	92.40%

Note* Isopropanol test is not requested under EN 14325, therefore there is no classification

AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	2
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

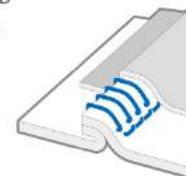
RESISTANCE TO PENETRATION BY PESTICIDES ACCORDING TO EN 14786	Sample 1	Sample 2	Sample 3	Sample 4
Betanal Expert	N.D	N.D	N.D	N.D
Folicur	N.D	0.22%	N.D	N.D
Amistar	N.D	N.D	N.D	N.D
Pinimor Granulat	N.D	N.D	N.D	N.D
U46-D-Fluid	N.D	N.D	N.D	N.D

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 4 Spray Test	Pass
Type 5 Inward Leakage Test	Pass
Type 6 Low Level Spray Test	Pass
EN 1073-2 Protective Clothing Against Radioactive Contamination	Class 3

Seam Construction

4-thread overlapped seam with liquid-proof tape

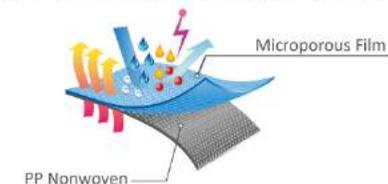
- 7-9 stitches per inch
- Thread fibre is 150D
- Bite depth at 4mm



Fabric Construction

Microporous film laminate PPSB

- MVTR is above 2500 gsm / 24hr (ASTM E96 BW)
- Hydro-head is above 2500 mm-H₂O (EN 20811)



ULTIMATEC

*Chemical
Jet Protection*



GO! AND BE FEARLESS

ULTIMATEC
4000

ULTIMATEC
5000

ULTITEC 4000

ULTITEC 4000 Chemical & Liquid Jet Resistant Protective Clothing

Designed for hazardous conditions. Fully liquid-proof protective clothing provides an outstanding barrier against various chemicals, liquid jets and infective agents.



TYPE3-B



TYPE4-B



TYPE 5-B



EN1149-5



EN 1073-2



EN 14126

Breathability



Liquid Protection



Particulate Protection



FEATURES

- **Outstanding barrier against chemical hazards**
An outstanding barrier against directional liquid jets, various chemicals, and biological hazards. The impervious fabric and seams sealed by chemical proof tapes meet the highest requirement of EN 14126 biological test.
- **Optimum protection & high identification**
Well-designed hood fits respirator perfectly, double layer storm flaps ensure liquid tight seal for zipper, and bright yellow fabric offers high identification.
- **Lightweight & durable**
Provides comfortable wearing experience to improve efficiency at work.
- **Sealed seam offers premium protection**
Chemical-proof tape on seam to ensure wearer being protected with no seepage.

APPLICATION

- Biological Hazards
- Chemical Handling
- Decontamination
- Disaster Management
- Disease Control
- Tank Cleaning
- Petrochemical
- Oil Refinery
- Shutdown Maintenance

PACKAGING

- 1pc / bag
- 12pcs / carton

Extra chinstrap



3-piece hood



Double layer storm flaps



Elasticated wrists with finger loop



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	5
Flex Cracking Resistance	EN ISO 7854/B	6
Trapezoidal Tear Resist.	EN ISO 9073-4	3
Tensile Strength	EN ISO 13934-1	3
Puncture Resistance	EN 863	2
Seam Strength	EN ISO 13935-2	4
AZO Colourants	EN 14362-1	Pass
Antistaticity	EN 1149-5	Pass
pH Value	EN ISO 3071	Pass
Resistance to Ignition	EN 13274-4	Pass
Colour Fastness to Perspiration	EN ISO 105-E04	Pass

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 2	Class 3
o-Xylene	EN ISO 6530	Class 2	Class 3
Butan-1-ol	EN ISO 6530	Class 2	Class 3

AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	6
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 3 Jet Test	Pass
Type 4 Spray Test	Pass
Type 5 Inward Leakage Test	Pass
EN 1073-2 Protective Clothing Against Radioactive Contamination	Class 1

Seam Construction

4-thread overlapped seam with chemical-proof tape

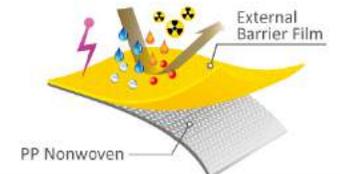
- 7-9 stitches per inch
- Thread fibre is 300D
- Compatible chemical proof tape



Fabric Construction

Impervious PE coated fabric

- Light weight and liquid splash protection
- Unique coated film fabric provides excellent chemical and biohazard resistance



ULTITEC 4000 Chemical Resistance Accessories (Taped)

ULTITEC 4000s Chemical Resistance Accessories (Stitched)

DD602 / DD602-X Sleeve Cover



- Elasticated openings at both ends (bicep and wrist)
- Neoprene rubber (latex free)

DD606 / DD606-X Shoulder Hood



- Elasticated face opening
- Neoprene rubber (latex free)

DD601 / DD601-X Lab Coat



- Laydown collar
- Front zipper closure for easy donning and doffing
- Neoprene rubber (latex free)

DD604 / DD604-X Shoe Cover

DD604S / DD604S-X Shoe Cover with Sole



- Elasticated opening up to ankle
- Anti-slip PVC sole design is optional
- Neoprene rubber (latex free)

DD605 / DD605-X Boot Cover

DD605S / DD605S-X Boot Cover with Sole



- Elasticated opening at ankle and up to calf
- Anti-slip PVC sole design is optional
- Neoprene rubber (latex free)
- DD605T / DD605T-X Boot cover with tie are optional
- DD605ST / DD605ST-X Boot cover with sole & tie is optional

DD607 / DD607-X Jacket



- Laydown collar with elasticated wrists
- Front zipper closure for easy donning and doffing
- DD607H / DD607H-X Hooded Jacket is optional

DD608 / DD608-X Pants



- Elasticated waist to fit body size
- Sufficient crotch area for easy movement

DD609 / DD609-X Sleeve Gown



- Enhanced frontal protection
- Adjustable ties at waist

DD603 Apron



- Enhanced frontal protection
- Neck loop
- Adjustable ties at waist

PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	5
Flex Cracking Resistance	EN ISO 7854/B	6
Trapezoidal Tear Resist.	EN ISO 9073-4	3
Tensile Strength	EN ISO 13934-1	3
Puncture Resistance	EN 863	2
Seam Strength	EN ISO 13935-2	4
AZO Colourants	EN 14362-1	Pass
Antistaticity	EN 1149-5	Pass
pH Value	EN ISO 3071	Pass
Colour Fastness to Perspiration	EN ISO 105-E04	Pass

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 2	Class 3
o-Xylene	EN ISO 6530	Class 2	Class 3
Butan-1-ol	EN ISO 6530	Class 2	Class 3

AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	6
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

Seam Construction

ULTITEC 4000

4-thread overlapped seam with chemical-proof tape

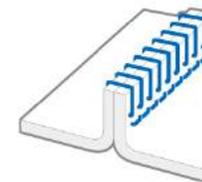
- 7-9 stitched per inch
- Thread fibre is 300D
- Compatible chemical proof tape



ULTITEC 4000s

4-thread overlapped seam

- 7-9 stitches per inch
- Thread fibre is 150D
- Bite depth at 4mm



ULTITEC 5000

ULTITEC 5000
High-level Chemical &
Liquid Jet Resistant
Protective Clothing

Designed for extremely
hazardous conditions. It
protects wearers from
wide range of chemical
liquid jets.



TYPE3-B



TYPE4-B



TYPE 5-B



EN1149-5



EN 1073-2



EN 14126

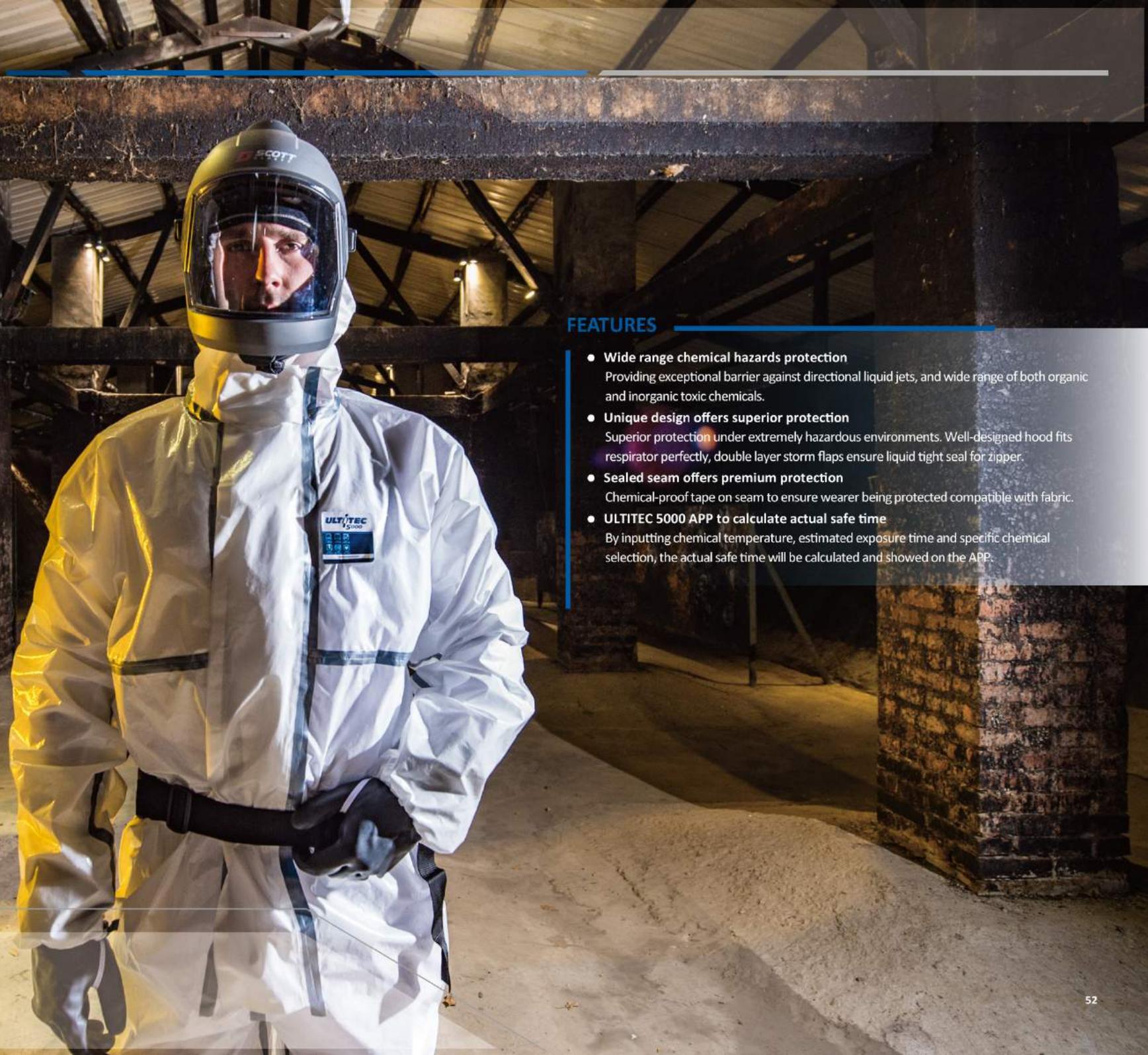
Breathability



Liquid Protection



Particulate Protection



FEATURES

- **Wide range chemical hazards protection**
Providing exceptional barrier against directional liquid jets, and wide range of both organic and inorganic toxic chemicals.
- **Unique design offers superior protection**
Superior protection under extremely hazardous environments. Well-designed hood fits respirator perfectly, double layer storm flaps ensure liquid tight seal for zipper.
- **Sealed seam offers premium protection**
Chemical-proof tape on seam to ensure wearer being protected compatible with fabric.
- **ULTITEC 5000 APP to calculate actual safe time**
By inputting chemical temperature, estimated exposure time and specific chemical selection, the actual safe time will be calculated and showed on the APP.

APPLICATION

Chemical Handling
Decontamination
Disaster Management
Petrochemical
Tank Cleaning
Oil Refinery

PACKAGING

1pc / bag
12pcs / carton



Extra chinstrap



3-piece hood



Double layer storm flaps



Elasticated wrists with finger loop



Elasticated ankles



Color



PERFORMANCE CHART

FABRIC PHYSICAL PROPERTIES	TEST METHOD	CLASS
Abrasion Resistance	EN 530	6
Flex Cracking Resistance	EN ISO 7854/B	1
Trapezoidal Tear Resist.	EN ISO 9073-4	4
Tensile Strength	EN ISO 13934-1	3
Puncture Resistance	EN 863	2
Seam Strength	EN ISO 13935-2	4
Antistaticity	EN 1149-5	Pass
pH Value	BS 3266	Pass
Resistance to Ignition	EN 13274-4	Pass

FABRIC CHEMICAL PROPERTIES	TEST METHOD	PENETRATION	REPELLENCY
Sulphuric Acid 30%	EN ISO 6530	Class 3	Class 3
Sodium Hydroxide 10%	EN ISO 6530	Class 3	Class 3
o-Xylene	EN ISO 6530	Class 3	Class 3
Butan-1-ol	EN ISO 6530	Class 3	Class 3

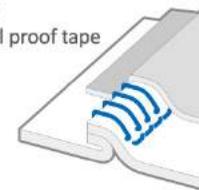
AGAINST INFECTIVE AGENTS with EN 14126	TEST METHOD	CLASS
Resistance to penetration by blood / fluids	ISO 16603	6
Resistance to penetration by blood-borne pathogens	ISO 16604	6
Resistance to wet microbial penetration	ISO 22610	6
Resistance to liquid aerosol penetration	ISO/DIS 22611	3
Resistance to dry microbial penetration	ISO 22612	3

WHOLE SUIT TEST PERFORMANCE	RESULT
Type 3 Jet Test	Pass
Type 4 Spray Test	Pass
Type 5 Inward Leakage Test	Pass
EN1073-2 Protective Clothing Against Radioactive Contamination	Class 2

Seam Construction

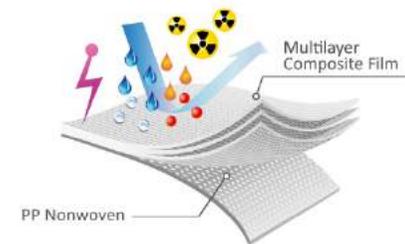
4-thread overlocked seam with chemical-proof tape

- 7-9 stitches per inch
- Thread fibre is 300D
- Compatible chemical proof tape



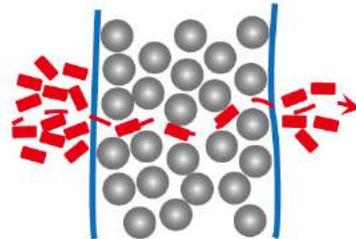
Fabric Construction

Multilayer Composite Fabric



WHAT IS PERMEATION?

Permeation is the process when a potential hazard chemical passes through a material on a molecular diffusion. Although there aren't any holes visible to naked eyes, there are still possibilities for chemical molecules to permeate through the fabric.



Chemical permeation test method

EU has recommended the following test methods:

1. EN 374-3: 2003 record the lowest BT and specifies a normalized permeation rate of 1.0 µg/cm²/min.
2. ISO 6529: 2001 (method A and B) specifies the mean BT to be reported at the normalized permeation rate of 1.0 µg/cm²/min or 0.1 µg/cm²/min.
3. EN 16523-1:2015 determinates material resistance to permeation by chemicals, of which EN 374-3 was replaced.

Test result of chemical permeation resistance

There are two crucial parameters on the technical data sheet, PR and BT. They help us to classify the protection level of the test fabric.

Permeation Rate (PR) indicates the rate at which chemical is transferred, in micrograms, through one square centimeter in one minute. (Unit: ug/cm²/min)

Breakthrough Time (BT) is the elapsed time between initial contact of chemical at outside of fabric and the specified permeation rate has been detected at inside of fabric. [Note*]

Performance classified by EN 14325

In Europe standard (as specified in EN 14325:2004) the result is classified into 6 classes based on the normalized breakthrough time (BT) is recorded when the permeation rate reach 1.0µg/cm²/min.

Measured BT	CLASS
> 10 mins.	Class 1
> 30 mins.	Class 2
> 60 mins.	Class 3
> 120 mins.	Class 4
> 240 mins.	Class 5
> 480 mins.	Class 6

ULTITEC 5000 APP to calculate actual safe time

ULTITEC 5000 APP is specialized in calculating actual safe time in assessing effectiveness of ULTITEC 5000 against chemical in use. After inputting chemical temperature, estimated exposure time and specific chemical selection, the actual safe time will be calculated and showed on the APP.

Note*

Misunderstanding of Breakthrough time (BT)

BT results of ">480 minutes" are often misunderstood to mean wearers are safe for more than 480 minutes. In reality, chemicals have started seeping through fabric at the 'breakthrough' point.



Fabric Permeation Data

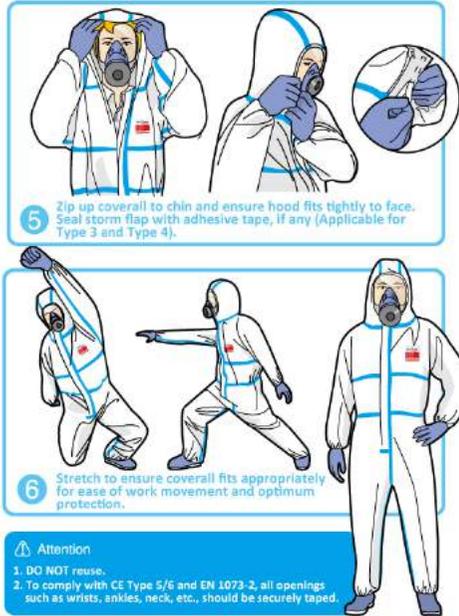
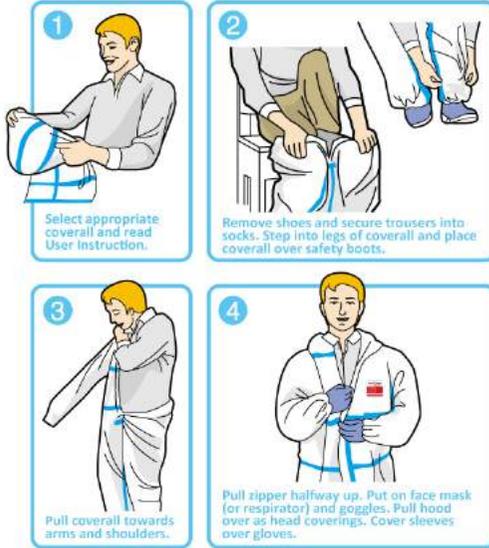
CHEMICAL	PHYSICAL STATE	CAS NO.	ULTITEC 4000		ULTITEC 5000	
			BREAKTHROUGH TIME	CLASS	BREAKTHROUGH TIME	CLASS
Acetic Acid (>95%)	Liquid	64-19-7	12 mins	Class 1		
Acetone	Liquid	67-64-1	Imm.	--	> 480 mins	Class 6
Acetonitrile	Liquid	75-05-08	Imm.	--	> 480 mins	Class 6
Ammonia (30%)	Liquid	7664-41-1	14 mins	Class 1		
Ammonium Hydroxide (28%)	Liquid	1336-21-6	28 mins	Class 1		
Benzene	Liquid	71-43-2	Imm.	--		
Carbon Disulphide	Liquid	75-15-0	Imm.	--	> 480 mins	Class 6
Chromic Acid (80%)	Liquid	7738-94-5	> 480 mins	Class 6		
Dichloromethane	Liquid	75-09-02	Imm.	--	> 480 mins	Class 6
Diesel Fuel	Liquid	----	7 mins	--		
Diethylamine	Liquid	109-89-7	Imm.	--	> 10 mins	Class 1
Ethyl Acetate	Liquid	141-78-6	Imm.	--	> 480 mins	Class 6
Formaldehyde (10%)	Liquid	50-00-0	135 mins	Class 4		
Formic Acid (85%)	Liquid	64-18-6	> 480 mins	Class 6		
Hydrochloric Acid (37%)	Liquid	7647-01-0	15 mins	Class 1		
Hydrofluoric Acid (48%)	Liquid	7664-39-3			> 480 mins	Class 6
Hydrogen Peroxide (30%)	Liquid	7722-84-1	> 480 mins	Class 6		
Isopropyl Alcohol (70%)	Liquid	67-63-0	> 480 mins	Class 6		
Mercury(II) Chloride (sat)	Liquid	7487-94-7	> 480 mins	Class 6		
Methanol	Liquid	67-56-1	Imm.	--	> 480 mins	Class 6
Methyl Ethyl Ketone	Liquid	78-93-3	Imm.	--		
Methylamine (40%)	Liquid	74-89-5	19 mins	Class 1		
Methylhydrazine	Liquid	60-34-4	2 mins	--		
N,N-Dimethyl Formamide	Liquid	68-12-2	> 480 mins	Class 6	> 480 mins	Class 6
n-Hexane	Liquid	110-54-3	Imm.	--	> 480 mins	Class 6
Nitric Acid (65%)	Liquid	7697-37-2	273 mins	Class 5		
Nitrobenzene	Liquid	98-95-3	Imm.	--	> 480 mins	Class 6
Nitromethane	Liquid	75-52-5	Imm.	--		
Perchloric Acid (70%)	Liquid	7601-90-3	> 480 mins	Class 6		
Potassium Chromate (sat,5%)	Liquid	7789-00-6	> 480 mins	Class 6		
Potassium Hydroxide (50%)	Liquid	1310-58-3	> 480 mins	Class 6		
Sodium Cyanide (10%)	Liquid	143-33-9	> 480 mins	Class 6		
Sodium Hydroxide (40%)	Liquid	1310-73-2	> 480 mins	Class 6		
Sodium Hydroxide (50%)	Liquid	1310-73-2			> 480 mins	Class 6
Sodium Hypochlorite (10-13%)	Liquid	7681-52-9	> 480 mins	Class 6		
Sulfuric Acid (98%)	Liquid	7664-93-9	> 480 mins	Class 6	> 480 mins	Class 6
Tetrachloroethylene	Liquid	127-18-4	Imm.	--	> 480 mins	Class 6
Tetrahydrofuran	Liquid	109-99-9	Imm.	--	> 40 mins	Class 2
Toluene	Liquid	108-88-3	Imm.	--	>20 mins	Class 1
Unleaded Gasoline	Liquid	----	Imm.	--		

Important Notice:

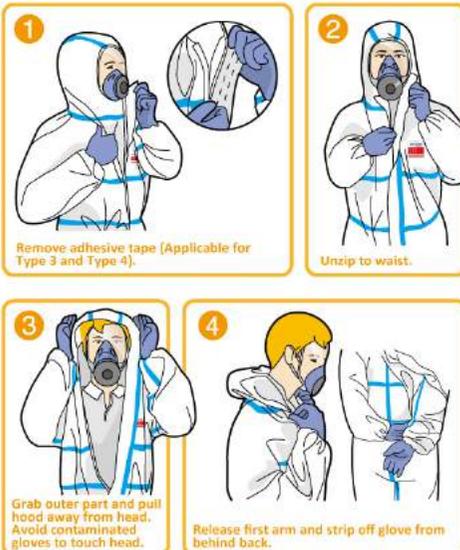
- Breakthrough time comes from the laboratory test result. Safe wearing time may be longer or shorter depending on some other conditions, including toxicity, exposure situations, and concentration of the substance. The user shall be responsible for determining how long the garment can be worn.
- Although permeation test proves fabric of CAT.III Type 3 protective clothing serves as barrier to certain chemicals in gas phase, it is NOT categorized as gas-tight suit.

Please contact us for the updated fabric permeation data list.

ULTITEC Coverall Donning Instruction



ULTITEC Coverall Doffing Instruction



STORAGE

- Store in dry, clean conditions in original packaging.
- Store away from direct sunlight, sources of high temperature, and solvent vapors.
- Store within the temperature range 15°C to 25°C (58°F to 78°F) and with relative humidity below 80%.
- Shelf life is 60 months from date of manufacture when stored as stated above.
- The antistatic property may reduce over time.
- The user must ensure the antistatic performance is sufficient for the application.

DISPOSAL

- ULTITEC products do not contain any halogenated compounds, and therefore may be incinerated or buried in a controlled landfill.
- Contaminated garments should however be disposed of in the same manner as contaminated waste, and always in accordance with national regulations.
- Uncontaminated garments can also be recycled. All disposal should follow the relevant national policy in case of confusion.

LIMITATIONS

- In contact with heavy oils, sparks or flames, or combustible liquids.
- In environments with high mechanical risks (such as: abrasions, tears, cuts).
- In environments with exposure to hazardous substances beyond the CE certification relating to the specific ULTITEC coverall chosen.
- In environments with conditions of excessive heat.
- Washing and laundering will impact the performance of the materials. Therefore, laundering is not recommended for ULTITEC products.

SIZE CHART

SIZE	CHEST	HEIGHT
S	84 - 92 cm	162 - 170 cm
M	92 - 100 cm	170 - 176 cm
L	100 - 108 cm	176 - 182 cm
XL	108 - 116 cm	182 - 188 cm
2XL	116 - 124 cm	188 - 194 cm
3XL	124 - 132 cm	194 - 200 cm
4XL	132 - 140 cm	200 - 206 cm